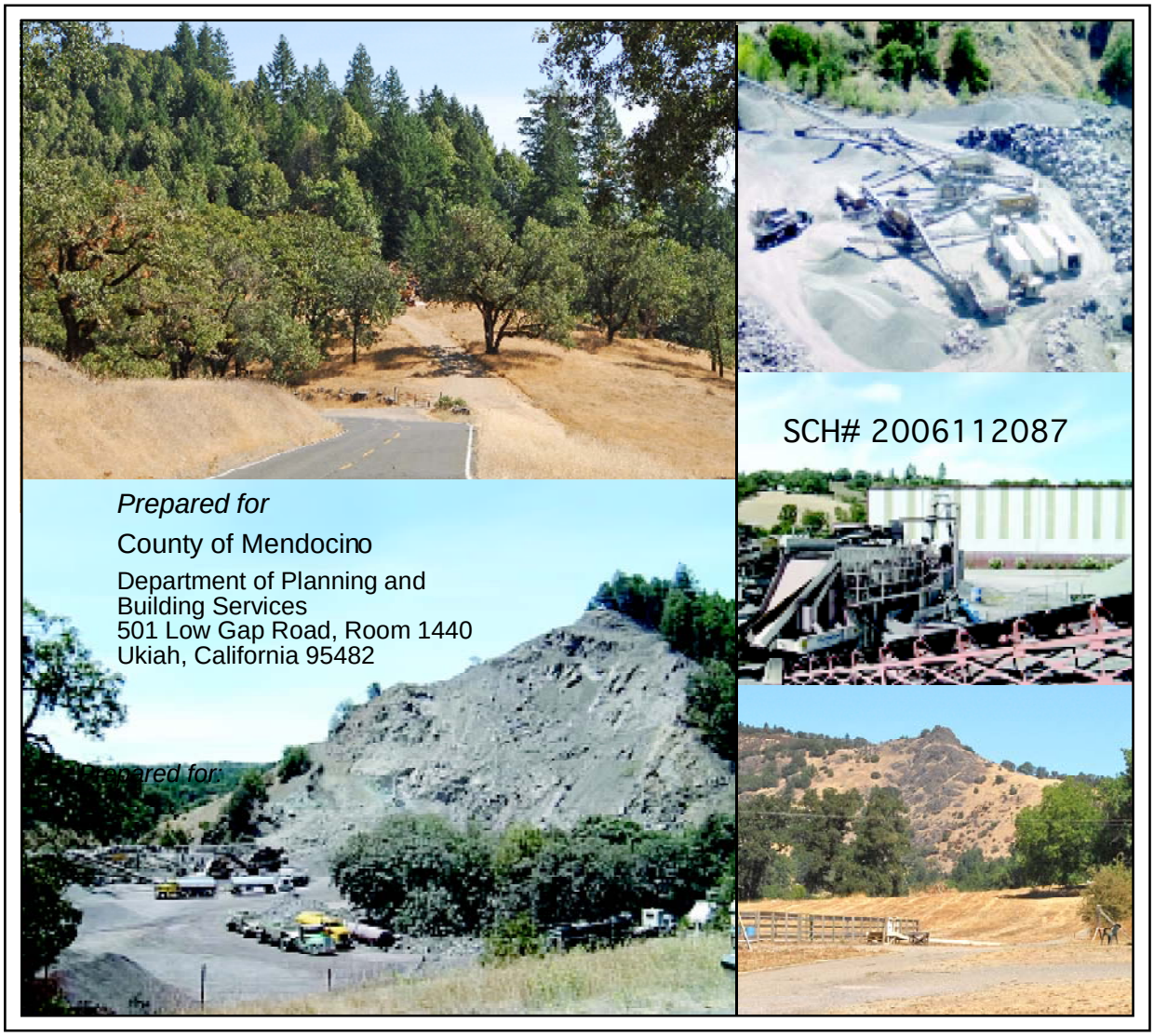
HARRIS QUARRY USE PERMIT AND RECLAMATION PLAN
REVISED DRAFT ENVIRONMENTAL IMPACT REPORT



Leonard Charles and Associates

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STATE CLEARINGHOUSE NO. 2006112087

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Chapter 1.0

Introduction

1.0 INTRODUCTION

1.1 Purpose of the EIR

This Revised Draft Environmental Impact Report (EIR) addresses the potential impacts of the proposed expansion of the Harris Quarry and construction of an asphalt processing facility at the quarry (hereafter called "the project"). The existing quarry is on the west site of U.S. Route 101 just south of the Ridgewood Grade and Black Bart Drive. The proposed project would expand the existing 11.5-acre quarry to a final size of about 30.6 acres. The project includes adding an asphalt plant, with associated support facilities, at a separate site on the project property, immediately south of Black Bart Drive and about 2,000 feet west of Highway 101. The project also includes a proposed Reclamation Plan that describes how the site will be reclaimed after completion of operations. Finally, the project includes a proposal to amend the County Zoning Ordinance to allow, under certain conditions, aggregate processing facilities at active quarries in the Rangeland zoning district.

This EIR has been prepared in conformance with the provisions of the *California Environmental Quality Act (CEQA) Guidelines* as amended to date. CEQA requires that public agencies prepare and certify an EIR before carrying out projects that may have significant effects on the environment (Public Resources Code Section 21080). Preparation of an EIR is the responsibility of the "lead agency," the public agency that has the principal responsibility for carrying out or approving the project (Public Resources Code, Section 21067). Because the County of Mendocino is the agency that would approve the proposed project, it is the lead agency for the project.

This EIR has been prepared under contract to the County of Mendocino (hereafter called "the County"). This EIR is an informational document that is intended to inform the County (the Lead Agency), other public agency decisionmakers, and the public of the significant environmental effects of the proposed project, potential mitigation measures that address these impacts, and alternatives to the proposed project. The County will consider the information in this EIR along with other information presented during the decision-making process when determining whether to adopt or modify the proposed project or an alternative. The information contained in this EIR does not control the County's ultimate decision on the project. However, if the County decides to approve the project, then the County must respond to each significant effect identified in the EIR by making findings under Section 15091 of the *CEQA Guidelines* and, if necessary, making a Statement of Overriding Consideration under Section 15093.

1.2 Contents of the EIR

This EIR has been prepared by the County of Mendocino as Lead Agency in conformance with the California Environmental Quality Act (CEQA). As such, it provides objective information addressing the environmental consequences of the proposed project and possible ways to reduce or avoid these impacts.

This EIR addresses all the areas of potentially significant impact as well as other potential impact areas that CEQA requires an EIR to investigate. The environmental

effects of the project are analyzed for each topic. The *CEQA Guidelines* define the effects of a project as changes from the environmental setting (i.e., existing conditions) that are attributable to the project. Particularly pertinent sections of the *CEQA Guidelines* are listed below.

Section 15121(a) (Information Document) states that "an EIR should be prepared with a sufficient degree of analysis to provide decisionmaker*s* with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts."

Section 15151 (Standards for Adequacy of an EIR) states that an EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make an informed decision taking into account the environmental consequences of the project.

Section 15003(l and j) (Policies) states that technical perfection is not necessary, but adequacy, completeness, and a good-faith effort at full disclosure are required. "CEQA requires that decisions be informed and balanced. It must not be subverted into an instrument for the oppression and delay of social, economic, or recreational development or advancement."

Section 15143 (Emphasis) states that the EIR shall focus on the significant effects on the environment. The significant effects will be discussed with emphasis in proportion to their severity and probability of occurrence. Effects dismissed in an Initial Study as clearly insignificant and unlikely to occur need not be discussed further in the EIR. Discussion of each major topic includes criteria used to evaluate whether an environmental impact is significant or insignificant

Section 15002(g) (Significance) states that a significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project. The significance criteria for each topic in this EIR have been developed based on guidelines set forth in the *CEQA Guidelines* as modified in some cases by standards established by the County. This EIR lists the thresholds of significance for each area of impact and assesses whether the project's impacts exceed these thresholds. If the impact does not exceed the threshold or if the recommended mitigation measures reduce the impact below the thresholds, then the impact is considered to be less-than-significant.

1.3 Public Review and Comment

A. Notice of Preparation

The County originally issued a Notice of Preparation (NOP) to prepare an EIR on the project on November 1, 2006. The County received 23 written responses to the NOP. These letters and the original NOP are on file with the Mendocino County Department of Planning and Building Services.

A Draft EIR was prepared and circulated for public review and comment in November 2007. Subsequent to the preparation of the Final EIR for the original project, the applicant redesigned the project. A Revised NOP was issued on August 4, 2010 for this revised project; the public review period closed on September 3, 2010. This NOP and responses to it are on file with the Mendocino County Department of Planning and Building Services.

B. Public Scoping Meetings

A Public Scoping Meeting for the original project was held in Willits on December 5, 2006. It was attended by approximately 30 people. Three members of the public offered comments on the scope of the EIR and the project.

A Public Scoping Meeting was held on the revised project in Willits on August 17, 2010. It was attended by approximately 27 members of the public. Nineteen members of the public offered comments on the scope of the EIR and the project. An Agency Scoping Meeting was also held on August 17, 2010. It was attended by representatives of the California Department of Fish and Game, the Mendocino County Water Agency, and the Mendocino County Department of Transportation.

Environmental questions and issues raised in the written responses to the NOP and oral comments at the public scoping meetings are summarized in Section 2.2.

C. Status of the Original Draft EIR and Comments Received on That Draft EIR

The Draft EIR for the original project was circulated for public review in October 2007; the public review period closed on February 15, 2008. Where the data and analyses remain pertinent for the revised project, data from the original Draft EIR has been incorporated into this Revised DEIR. Otherwise, new or revised analyses have been done to reflect the revised project, changing baseline conditions, additional new information provided on project operations, and changes in the regulatory setting and requirements. To clarify a question raised by the public at the EIR Scoping Meeting, this Revised Draft EIR is a stand-alone document. It replaces the original DEIR, and there is no need to refer to that original DEIR to understand the revised project or its impacts.

A number of attendees at the August 2010 EIR Scoping Meeting wanted to know where the responses are to the questions and comments they presented during the public review of the original DEIR. CEQA does not require written response to these original comments. This Revised Draft EIR is not a Response to Comment report. It is an

assessment of the revised project. Many of the comments submitted on the original DEIR are no longer pertinent and/or have been addressed in the analyses in this Revised DEIR. However, all these letters and comments remain part of the administrative record for the project. All of these comments were read. In fact, responses to about 75% of those comments had been drafted at the time the original EIR process was halted while the applicant revised the project. Those responses have been incorporated in the text when they are accurate and pertinent to the revised project. CEQA Guidelines do require that this Revised EIR include a summary of revisions to the original Draft EIR that were made. This discussion is included in Section 2.2 of this report.

The County advises all reviewers of this Revised Draft EIR that old comments on the original Draft EIR will not be responded to, and that new comments need to be submitted on this Revised EIR, consistent with CEQA Guidelines Section 15088.5(f)(1) that states, "The lead agency shall advise reviewers, either in the text of the Revised EIR or by an attachment to the Revised EIR that although part of the administrative record, the previous comments do not require a written response in the final EIR, and that new comments must be submitted for the Revised EIR. The lead agency need only respond to those comments submitted in response to the recirculated Revised EIR."

D. Distribution of the Revised Draft EIR

As noted in the previous section, the letters and verbal comments made on the original Draft EIR do not apply to this Revised DEIR. People wishing to submit comments will need to submit new letters and/or new verbal comments at EIR Public Hearings.

A public review period of at least 45 days is provided for this Revised Draft EIR. This review period begins on the publication date of the Notice of Completion of the Revised Draft EIR. During the public review period, the County will hold one public hearing on the Draft EIR. In addition, public agencies and interested individuals may submit comments in writing to John Speka, Mendocino County Department of Planning and Building Services, 1550 Low Gap Road, Room 1440, Ukiah, CA 95482.

The information contained in this report is considered to be accurate, but it is subject to review and comment by the County, other responsible agencies, and the public. The public is invited to review the document and comment on its accuracy and completeness.

E. Certification of the Final EIR

Once the public review period is closed, a Final EIR will be prepared. The Final EIR will incorporate this Revised Draft EIR by reference, and it will contain all comments on this Draft EIR, responses to those comments, and any revisions to the text of this Revised Draft EIR. The Final EIR will be considered by the Mendocino County Planning Commission. When the Planning Commission considers the EIR to be complete and accurate, it will recommend that the Board of Supervisors certify the document. The Board of Supervisors will then consider the EIR and decide whether to certify the document. The Final EIR must be certified before any action on the proposed project can occur.

Before the project is approved, the Board of Supervisors would be required to find (per CEQA Guidelines Section 15091) for each significant impact of the project: 1) that changes in the project would reduce the impact to a level that is less than significant; 2) that such changes are within the jurisdiction of a public agency other than the County; or 3) that mitigation measures and alternatives are infeasible. For impacts that the County determines cannot be mitigated to a less-than-significant level, it would be necessary for the Board of Supervisors to adopt a Statement of Overriding Considerations (per CEQA Guidelines Section 15093) that describes how benefits of the project outweigh those impacts before approving the project.

1.4 Range of Alternatives Assessed in the EIR

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

The alternatives for this project consist of the following:

1. No Project – No Future Development Alternative;
2. No Project – Reasonably Foreseeable Development Alternative;
3. Quarry Only;
4. Quarry and Temporary Asphalt Plant;
5. Project Redesign;
6. Reduced Production; and
7. Alternative Location.

1.5 Intended Uses of the EIR

A. Lead Agency

The Lead Agency under CEQA for the project is the County of Mendocino. The Mendocino County Planning Commission will review the EIR and make a recommendation to the Board of Supervisors on whether to certify the document. The Planning Commission may approve or deny the Use Permit and Reclamation Plan and make recommendations to the Board of Supervisors about the proposed rezoning. The County Board of Supervisors will review the EIR and determine whether to certify the document. It will determine whether to approve the rezoning. If the Planning Commission's decisions are appealed, the Board will determine whether to approve the Use Permit and the Reclamation Plan.

The Mendocino County Department of Planning and Building Services will review project construction plans. The Department reviews the consistency of the project with the

County General Plan and the *Mendocino County Surface Mining and Reclamation Regulations* (Chapter 22.16 of the County Zoning Ordinance), and makes recommendations on the project to the Planning Commission. The Department is also responsible for issuing grading permits and building permits.

B. Responsible Agencies

Responsible Agencies are agencies that must issue some form of permit or determination for the project and, thus, rely on the EIR for the environmental documentation required prior to issuing said permit. Potential Responsible Agencies and required approvals for the proposed Harris Quarry expansion project are listed below.

1. Federal Agencies

a. *Army Corps of Engineers* - regulates activities that have the potential to affect navigable waters under Section 10 of the Rivers and Harbors Act of 1899 (Section 10 permits) and waters of the United States under Section 404 of the Clean Water Act (Section 404 permit). The Corps would be responsible for determining its jurisdiction over wetlands and waters of the U.S. that would be removed or filled and determining what level of mitigation would be required for that removal/filling.

b. *Environmental Protection Agency* - oversees the analysis of the Army Corps of Engineers regarding the issuance of permits for filling wetlands under Section 404 permits and issues permits for point source discharges to waterways.

c. *U.S. Fish and Wildlife Service* - administers the Federal Endangered Species Act and the Marine Mammal Protection Act. The USFWS is an advisory agency to the Army Corps on Section 404 and Section 10 projects. The USFWS reviews mitigation plans for these projects.

d. *National Marine Fisheries Service* - administers the Federal Endangered Species Act and the Marine Mammal Protection Act as they pertain to marine and anadromous species.

2. State Agencies

a. *Regional Water Quality Control Board (RWQCB)* – regulates discharges to waterways through the adoption of Waste Discharge Requirements (WDR) and National Pollution Discharge Elimination System (NPDES) permits.

b. *Office of Planning and Research* - circulates EIRs for review by State agencies.

c. *Department of Fish and Game (CDFG)* – is responsible for protection of the State's biological resources. It has authority to oversee work done in streams pursuant to Fish and Game Code 1601 and 1603. An applicant who proposes to substantially divert the natural flow of a stream, substantially alter its bed or bank, or use any material from the streambed must first enter into a "Streambed Alteration Agreement" with CDFG.

d. *California Department of Forestry and Fire Protection (CAL FIRE)* - responsible for approving a Timberland Conversion Permit and Timber Harvest Plans.

e. *Native American Heritage Commission* - mandated to preserve and protect places of special religious or cultural significance pursuant to Section 5097 et seq. of the Public Resources Code.

f. *Department of Conservation* - responsible for implementation of the State Surface Mining and Reclamation Act (SMARA). The Department will review the project Reclamation Plan.

g. *Department of Toxic Substances Control* - oversees the clean-up of sites where hazardous substances, including asbestos, have been released.

h. *Department of Transportation* – is responsible for approving encroachments to and improvements on State Route 101.

3. Local Agencies

a. *Mendocino County Department of Transportation* - responsible for reviewing projects for impacts to County roads.

b. *Mendocino County Air Quality Management District* - must approve an Authority to Construct and Permit to Operate.

c. *Mendocino County Sheriff's Department* - must approve a permit for blasting.

d. *Mendocino County Department of Planning and Building Services* – is responsible for monitoring project compliance with the Conditional Use Permit and the County's mining ordinance.

C. Other Agencies

In addition to the Lead and Responsible Agencies, including those that may issue some form of permit for the project, the Draft EIR will be sent to Federal, State, and local agencies that provide services in the area. This includes the Little Lake Fire Protection District.

The Draft EIR will also be sent to any identified trustee agencies. The *CEQA Guidelines* (Section 15386) define "trustee agency" as "a State agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California." Trustee Agencies include the California Department of Fish and Game, which has jurisdiction over State fish and wildlife, designated rare or endangered native plants, and game refuges, ecological reserves, and other areas. (See discussion under "State Agencies" above.)

1.6 EIR Organization

After this ***Introduction Chapter***, the Draft EIR is organized as follows:

- ***Chapter 2.0 – Summary Section***: identifies areas of controversy, highlights the important effects of implementing the project, and identifies some of the measures available to mitigate significant adverse impacts.

- ***Chapter 3.0 – Project Description***: describes the location of the project site, existing land uses on and near the project site, all aspects of the project as proposed, and the approvals and permits required before the project could be implemented, if approved.

- ***Chapter 4.0 – Environmental Impact Analysis:*** describes existing environmental conditions on the site and within the study area, identifies probable impacts from implementing the project, describes mitigation measures required to substantially reduce or eliminate potentially significant adverse impacts, and assesses the project for consistency with pertinent public plans and policies.

- ***Chapter 5.0 – Topical Issues and Impact Summaries:*** discusses growth inducing impacts, cumulative impacts, and effects of no significance. It assesses the difference in outcome between the project as proposed and seven project alternatives. This chapter also identifies an environmentally superior alternative among the alternatives.

- ***Chapter 6.0 – Report Preparation:*** includes the report preparers, the people and organizations consulted, and the bibliography.

- ***Appendices:*** include the NOP and technical background material supporting the Draft EIR text.

Chapter 2.0

Summary

2.0 SUMMARY CHAPTER

This summary section is provided in accordance with State CEQA Guidelines Section 15123. As stated in the Guidelines Section 15123(a), "(a)n EIR shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." State CEQA Guidelines Section 15123(b) states, "(t)he summary shall identify: (1) each significant effect with proposed mitigation measures and alternatives that would reduce or avoid that effect; (2) areas of controversy known to the Lead Agency including issues raised by agencies and the public; and (3) issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects." Accordingly, this summary includes a brief synopsis of the project and project alternatives, environmental impacts and mitigations, cumulative effects and mitigation, areas of known controversy, and issues to be resolved in the environmental impact report (EIR). Table 2-2, at the end of this chapter, presents the summary of potential environmental impacts, their level of significance before mitigation, mitigation measures, and levels of significance with mitigation.

2.1. Summary of the Proposed Project

See Section 3.2 in the following chapter for a detailed description of the proposed project. The following is a brief summary of the primary project elements.

The applicant, Northern Aggregates, Inc., seeks County approval of the following:

1. Amending the Mendocino County Zoning Code to create a Mineral Processing Combining District (MPCD).

2. Adding an MPCD to a portion of project parcel APN 147-140-07.

3. Rezoning 18 acres of Assessor's Parcel No. 147-140-07 to add a new Mineral Processing Combining District that would allow processing of aggregate for the length of the Use Permit. The applicant has volunteered to include a condition of approval requiring the applicant to submit an application to revert the 18 acres back to Rangeland zoning at the end of the Use Permit.

4. Use Permit Renewal/Modification (UR 19-83/2005) to allow:

    - extraction and processing of 200,000 cubic yards (CY) *in situ* per year for a 30-year period

    - production of up to 150,000 tons (58,280 CY) of asphalt per year

    - nighttime operations up to a maximum of 100 nights per year

5. A revised Reclamation Plan that directs how the site will be reclaimed at the end of the use permit.

The proposed project would allow the applicant to continue to mine the existing quarry and expand the quarry to the north and to the west. Quarrying would use the same techniques and equipment currently used at the site. Some of the more important elements of the project include:

- aggregate would be processed on the site and sold to the public;
- some of the aggregate would be hauled via a paved on-site haul road to the new asphalt plant where it would be used to make asphalt that would be available for sale to the public;
- an aggregate wash plant will be added to the site to process aggregate for use in making concrete and asphalt;
- up to 10,000 cubic yards per year of recycled asphalt and concrete will be processed at the site;
- the project will use about 2,957,800 gallons of water a year for processing, washing, and dust control, which would be provided by an existing on-site well; and
- after 30 years, the site will be reclaimed to a mosaic of vegetation types similar to those that currently exist on the site.

The applicant has stated that is has no intention of mining the site after the termination of the 30-year permit. Nevertheless, this EIR examines the cumulative impacts of possible future mining of the site by a future owner or operator.

2.2 Scoping Comments, Areas of Controversy, Comments on the Original Draft EIR and Where Those Comments/Issues Are Addressed in this Revised Draft EIR

A. Comments Submitted in Response to the Notice of Preparation and During EIR Scoping Meetings

The following list summarizes comments that are pertinent to the EIR (this does not include comments on the merits of the project) submitted during the review period for the Notice of Preparation and at the EIR Scoping Meetings for this Revised Draft EIR.

1. Components of the asphalt plant and asphalt processing facility site could fail during an earthquake and release sediment and hazardous materials into the environment. Runoff could carry these pollutants to the tributary of Forsythe Creek below the site and adversely affect water quality of Forsythe Creek and the Russian River. The EIR should examine project stability given the probability of seismic activity in the area. *See Impact 4.1-C for a discussion of these geologic issues.*

2. The EIR should discuss how the County can ensure that water use and production rates remain within the bounds proposed by the project and assessed in the EIR. *Verification methods will be described in the Mitigation Monitoring and Reporting Program that will be part of the Final EIR.*

3. The EIR should assess the potential of pollutants escaping the asphalt processing facility and entering Forsythe Creek, thereby adversely affecting steelhead, salmon, and other fish and aquatic life and human health. *See Impact 4.2-A for impacts to water quality and Impact 4.3-B for a discussion of impacts to salmonids.*

4. The project involves filling a drainage channel and portions of two wetlands. Mitigation is needed in the EIR to address the loss of the stream and wetlands. *See Impact 4.3-D for a discussion of impacts to wetlands.*

5. Increased truck traffic poses a safety hazard for drivers on Highway 101 and especially for drivers accessing Black Bart Drive. This hazard is aggravated during periods of bad weather and limited visibility (e.g., fog). The EIR should assess all safety impacts. Do proposed acceleration and deceleration lanes meet standards? *See Impacts 4.4-B to E for a discussion of traffic safety impacts.*

6. The EIR should assess the hazard of fuel trucks turning into the project. *Impacts 4.4-B, C, and D and Impact 4.9-A regarding fuel trucks and traffic safety.*

7. The EIR should assess project-generated noise, particularly nighttime noise, on residents living to the west of the site and to residents on the property owned by the Church of the Golden Rule. *See Impacts 4.5-A, D, and E for a discussion of noise impacts to nearby residents.*

8. The EIR should assess the impacts of operation of the asphalt plant and the pollutants it will emit on air quality and the health of people living in the vicinity of the plant. *See impact discussions in Section 4.6 regarding impacts to air quality and health.*

9. The EIR should assess the impacts on global climate change, given changes in assessment techniques and significance criteria developed subsequent to the original EIR. *See Impacts 4.6-H and 4.6-I regarding impacts on global climate change.*

10. The EIR should re-assess visual impacts of the project, especially from the asphalt processing facility site and determine whether additional mitigations are warranted. *See the impact discussions in Section 4.7.*

11. The EIR should include photos-simulations of the asphalt plant, quarry, and highway widening after termination of the project. *The County determined that two new photos-simulations were required for this revised Draft EIR. They do not include the highway widening mitigation nor landscaping once reclamation is conducted.*

12. The project should reassess the impacts on other areas if the zoning code is changed to include the proposed new Mineral Processing Combining District. *See Impact 4.10-D regarding this issue.*

13. There should be third-party verification of annual extraction. *The County has the authority to verify extraction rates. Any third-party verification would be a policy decision to be decided by the County.*

A number of commenters submitting comments during the NOP review (as well as commenters on the original Draft EIR) asked questions or requested analysis that concern the merits (the pluses and minuses) of the project. These requests include: 1) discuss whether there is a need for more aggregate and asphalt in the County; 2) how will the project affect property values; 3) how can the project be approved when the quarry has produced more aggregate than allowed under the existing Use Permit, and 4) where is the cost/benefit analysis for the project. While these are all valid questions, they do not directly involve environmental impacts and are not the subject of this EIR. These and other merit issues can be raised with the County Planning Commission and the Board of Supervisors when those bodies take testimony on the merits of the project and whether it should be approved.

B. Comments Made on the Original Draft EIR

CEQA Section 15088.5 (g) states that when an EIR is substantially revised and recirculated for public review that the Revised EIR contain a summary of the revisions made. The major revisions are summarized below (however, this summary is not intended to be an exhaustive list of all the differences between the two reports). In addition, the beginning of each section in Chapter 4.0 describes the major changes made to each impact discussion.

1. The Project Description section (Section 2.2 of the original EIR and Section 3.2 of this Revised EIR) has been revised to reflect the current application for: 1) a 30-year Use Permit rather than an end-of-life Use Permit; 2) the quarry expansion includes less area and is not as deep as the original project (it maintains the existing quarry floor elevation); 3) the concrete plant has been deleted from the revised project; 4) nighttime operations could occur up to 100 nights per year; and 5) potential wetland and stream mitigation sites have been identified. The revised Project Description clarifies several components that were unclear in the original proposal, such as what the baseline production of the quarry is. The Reclamation Plan has been revised to reflect the changes listed above as well as to address several concerns identified by the State Office of Mine Reclamation in their review of the original project. The project description and baseline conditions have been clarified to respond to comments on the original EIR made by reviewers, including several consultants and an attorney retained by Keep the Code (an “unincorporated association of local residents”).

2. All analyses of impacts to environmental resources in Chapter 3.0 of the original EIR (Chapter 4.0 of the Revised Draft EIR) have been revised to address: 1) the changes to the project; 2) minor changes in the baseline conditions; 3) changes to significance criteria (based on certain agencies adopting new significance criteria); and 4) new data provided by the applicant on traffic, groundwater

pumping, possible Highway 101 improvements, and wetland/stream mitigation projects. Certain changes and clarifications responding to pertinent comments and recommendations submitted during the public review of the original EIR have been incorporated. All of these comments submitted on the original Draft EIR were reviewed by the EIR preparers. In fact, draft responses to about 80% of those comments had been drafted at the time the original EIR process was halted while the applicant revised the project. Those responses have been incorporated in the text where pertinent to the revised project. These changes and new information resulted in changes to impacts as described below.

3. The Geology and Soils section (Section 3.1 of the original EIR and Section 4.1 of this Revised EIR) has been revised to reflect changes in the project, including elimination of deepening the quarry floor.

4. The Hydrology and Water Quality section (Section 3.2 of the original EIR and Section 4.2 of this Revised EIR) has been revised to reflect project changes, including additional stormwater controls and additional data about the design and operation of the bio-retention swale. Where warranted, mitigation measures recommended by the Mendocino County Water Agency in their review of the original EIR have been incorporated either into the revised project or the EIR-recommended mitigation measures. New data on project water demand and the effects of groundwater pumping on neighboring wells and springs has been added, and previous mitigations for these impacts have been revised.

5. The Biological Resources section (Section 3.3 of the original EIR and Section 4.3 of this Revised EIR) has been revised to reflect project changes, additional delineations of streambed and wetland filling, new tree counts, and follow-up special status species surveys. Additional discussion of impacts to salmonids was added in response to comments made on the original EIR. The applicant's proposed mitigations for stream and wetland filling are reviewed. Mitigation measures for wetland and oak woodland impacts have been modified based on this new information and analyses. Mitigations have been revised to comply as far as feasible, given the revised project, with recommendations made by the State Department of Fish and Game in their comments for the Revised EIR scoping. Clarifications and additional analysis of impacts to Forsythe Creek and salmonids has been added to respond to comments on the original EIR made by a biologist retained by Keep the Code.

6. The Traffic section (Section 3.4 of the original EIR and Section 4.4 of this Revised EIR) has been amended to incorporate additional data on truck trip generation, speed change lane warrants, and safety impacts at night and when there is limited visibility. New mitigations have been recommended, including a southbound acceleration lane, additional lighting for nighttime operations, restrictions on left turns during periods of limited visibility, and ongoing monitoring of operational and safety conditions (with provisions, if warranted, for further operational modifications and/or highway improvements). Additional data was included and clarifications were made to respond to requests made by the California Department of Transportation and other technical reviewers of the original EIR. The discussion of traffic safety was expanded to address the concerns of many reviewers of the original EIR. Comments on the original EIR

made by TJKM (traffic consultants retained by Keep the Code) were used in preparing the new traffic analyses. The Revised EIR describes how improvements to Highway 101 are EIR-recommended mitigation measures rather than part of the project proposal. The improvements are more extensive than assessed in the original EIR. The EIR addresses the secondary impacts of this highway widening.

7. The Noise section (Section 3.5 of the original EIR and Section 4.5 of this Revised EIR) has been revised to reflect the new traffic analysis and to further discuss the effects of nighttime operations. A recommended mitigation made by the County Environmental Health Division was added.

8. The Air Quality section (Section 3.6 of the original EIR and Section 4.6 of this Revised EIR) has been revised to reflect project changes and new pollutant requirements. The discussion of Global Climate Change was substantially expanded to include new guidelines for assessing these impacts and new significance criteria adopted by the Mendocino County Air Quality Management District (MCAQMD). Several recommendations that MCAQMD made during their review of the original EIR have been incorporated. Where pertinent, additional clarification was made in response to issues and recommendations raised by reviewers of the original EIR (particularly comments submitted by Miller Environmental Consultants (MEC), consultants retained by Keep the Code).

9. The Aesthetics section (Section 3.7 of the original EIR and Section 4.7 of this Revised EIR) was revised to reflect project changes. Changes to the layout of the asphalt processing facility site were assessed after preparation of a revised photosimulation of views of that site. Additional discussion of the effects of nighttime operation of the asphalt facility was added. Suggestions made by a commenter on the original EIR regarding additional berms and landscaping to mitigate project visual impacts were assessed.

10. Minor revisions were made to the Public Services section (Section 3.8 of the original EIR and Section 4.8 of this Revised EIR) and the Hazards and Hazardous Materials section (Section 3.9 of the original EIR and Section 4.9 of this Revised EIR) to reflect project changes and changes in baseline conditions.

11. The Land Use section (Section 3.10 of the original EIR and Section 4.10 of this Revised EIR) has been revised to reflect project changes. Additional discussion was added about effects on Ridgewood Ranch to address concerns raised by several commenters on the original EIR. The effect of the proposed new zoning designation on other quarries was revisited to incorporate new data on the status of these quarries.

12. The Energy section (Section 3.11 of the original EIR and Section 4.11 of this Revised EIR) has been revised to address changes in project equipment and operations.

13. The Cultural Resources section (Section 3.12 of the original EIR and Section 4.12 of this Revised EIR) has been revised to reflect correspondence with tribes

and nations that were contacted on the recommendations of the State Native American Heritage Commission.

14. The Plan Consistency section (Section 3.13 of the original EIR and Section 4.13 of this Revised EIR) has been revised to provide a consistency analysis with the new County General Plan (adopted subsequent to preparation of the original EIR).

15. The Project Alternatives section (Section 4.2 of the original EIR and Section 5.2 of this Revised EIR) has been revised to include the project changes and new data developed that describes and compares the vehicle miles traveled (VMT) to transport aggregate and asphalt for the project and several of the project alternatives. Original alternatives that included the concrete plant have been eliminated or revised. Alternative 5 has been revised to include additional design mitigations.

16. The Summary chapter (Chapter 2.0 of both EIRs) has been revised to reflect all the changes in impacts and mitigations summarized above.

17. The Introduction chapter (Chapter 1.0 of both EIRs) had been changed to explain the purpose of the Revised EIR. The Project Description portion of the original Chapter 1 has been moved to Chapter 3 of the Revised EIR).

All comments made on the original EIR have been reviewed. Where appropriate, additional clarification, analyses, and/or mitigation have been added to this Revised DEIR to address questions and recommendations raised in those comments.

It is noted that a number of commenters on the original EIR felt that the original EIR did not accurately assess the project impacts and/or minimized the significance of those impacts. As noted above, the EIR has been revised as warranted given the comments submitted. As described at the beginning of this EIR, the intent of the document is to provide a measured and objective third-party assessment of impacts and project alternatives.

C. Areas of Controversy

The proposed project raises issues and some areas of controversy that will be considered by County decision-makers. Controversial issues are known through expressions of public opinion that are documented in the record or obtained through public meetings as summarized above. Some areas of controversy are not within the purview of CEQA because that statute focuses on evaluation of significant effects to the *physical environment*. Those areas of controversy that relate to a physical impact issue are noted in the list below.

The main areas of controversy expressed to date are as follows;

- The combining district would have potentially significant effects on many areas of the County. A separate EIR should have been prepared on that proposed district.
- The project would adversely affect the southern "entry" to Willits.
- The project would adversely affect nearby wells and springs.

- The project could cause erosion and leakage of chemicals that would adversely affect water quality and salmonid populations in Forsythe Creek.
- Constructing the asphalt processing facility pad will result in slope stability problems leading to failure and water pollution.
- Emissions of pollutants into the air would adversely affect human health for local residents.
- Increased truck traffic will create a significant traffic safety hazard for drivers accessing Black Bart Drive.
- The project would adversely increase noise levels at nearby residences.
- The project, including night lighting of the asphalt processing facility, would adversely effect views from Highway 101, Black Bart Drive, and residences in the area.
- Use of the asphalt plant for up to 100 nights per year would adversely affect the residential neighborhood to the west because of noise and lights.
- The project could cause fires that would block access to and from Ridgewood Subdivision.
- The project would adversely affect property values in the area.

These issues, except for effects on property value, are all addressed in the pertinent section of Chapter 4 of this EIR.

2.3 Summary of Significant Unavoidable Impacts

This EIR identifies 30 potentially significant adverse impacts that would result from project development, as well as 6 cumulative impacts and one secondary impact resulting from implementing EIR-recommended mitigations. The EIR presents mitigation measures that would eliminate most of those impacts or reduce them to a level that is considered less-than-significant. Five impacts cannot be reduced to a less-than-significant level; they are:

Project-Specific Impacts

1. Haul trucks and other project-generated traffic would generate emissions of nitric oxide and nitrogen dioxide (NOx) that would exceed the adopted Mendocino County Air Quality Management District's significance threshold for new projects (Impact 4.6-C).

2. The asphalt processing facility would change views from Black Bart Drive (Impact 4.7-A).

3. The quarry expansion would change views from vantage points on Ridgewood Ranch (Impact 4.7-B).

4. Lighting of the asphalt processing facility would impact night views in the area (Impact 4.7-D).

Cumulative Impact

5. The quarry expansion and highway improvements would change views from Highway 101 (Impact 4.7-C).

The above impacts are considered significant and unavoidable. These are the conclusions of the EIR preparers and County staff. If the Board of Supervisors concurs that these impacts are significant and unavoidable, then the Board of Supervisors must adopt a Statement of Overriding Considerations prior to approving the project (if it decides to approve the project). In accordance with Section 15093 of the CEQA Guidelines, the Statement of Overriding Considerations must explain why the project is being approved despite these unavoidable adverse significant impacts.

If the Board of Supervisors does not include the required mitigations recommended in this EIR for other potentially significant impacts, then the impacts those measures are intended to mitigate would also be judged as remaining significant adverse impacts.

It is noted that, during the public review process, the Board of Supervisors has the authority to determine that any of these impacts are, in fact, significant despite recommended mitigations. Ultimately, this EIR is the County's EIR, and the Board of Supervisors is responsible for its conclusions. If the Board of Supervisors believes, on the basis of data presented in this report, additional data provided during the public review process, or other public data available to the Board of Supervisors, that impacts should be identified as "significant," then the Board of Supervisors has the authority to find such impacts significant. In doing so, the Board of Supervisors must provide written support to justify its action(s). If impacts are deemed significant, then the Board of Supervisors must address these impacts when issuing a Statement of Overriding Considerations if the Board of Supervisors decides to approve the project.

2.4 Summary of Growth-Inducing Impacts

Growth-inducing impacts of the proposed project are assessed in Section 5.1 of this EIR. That discussion concluded that the project would provide aggregate and asphalt needed for a variety of construction projects. However, there is no evidence that construction in the area that would be served by the project would slow or cease if the project were not approved. If the project did not supply these materials, they would be provided by other suppliers. The project facilitates development, but it does not induce any new development. The project would hire 9 new employees, which would have a less-than-significant impact on the area population. The approval of the proposed Mineral Processing Combing District is not expected to result in a substantial number of other owners seeking a rezoning. As discussed in Impact 4.10-D later in this report, there are three other active quarries in the County that meet the criteria needed to allow rezoning to this district, and all three of these quarries have constraints that would limit the desirability of such a rezoning. It is speculative to posit whether the owners of any of these three quarries would seek such a rezoning, but it seems highly unlikely for two and unlikely for the third. The project would have less-than-significant growth-inducing impacts.

2.5 Summary of Cumulative Impacts

The following summarizes cumulative impacts resulting from the project plus possible future mining of the quarry and other projects:

Hydrology and Water Quality Impacts. As described under Impacts 4.2-D and 4.2-E, the proposed project, possible future expansion of the quarry, future timber harvesting, and any future residential development in the Forsythe Creek watershed could result in erosion and sedimentation entering the creek. This sedimentation would adversely affect salmonid habitat. Mitigation measures recommended for the project would reduce the project's increment of any cumulative effect on water quality to a less-than-cumulatively considerable level. Future quarry expansion would also affect streamflow in Forsythe Creek (Impact 4.2-F) and groundwater supplies (Impact 4.2-G). Because the project would be terminated before these future impacts may occur, the project makes a ***less-than-cumulatively considerable*** contribution to these possible future impacts.

Biological Impacts. As described in Impacts 4.3-I and 4.3-J, the project plus future quarry expansion, timber harvests, and incidental residential development in the Forsythe Creek watershed could adversely affect oak woodlands and water quality of the stream, thereby adversely affecting salmonid populations. Because the project includes mitigations to reduce project impacts on these resources to a less-than-significant level, and because the project would be terminated before these future impacts may occur, the project makes a ***less-than-cumulatively considerable*** contribution to these possible future impacts. The project also makes no contribution to a possible future impact of lowering the quarry floor to an elevation that adversely affects streamflow in the Forsythe Creek tributary nearest the quarry.

Traffic at Intersections. As described under Impact 4.4-E, traffic generated by the project would reduce the level of service (LOS) at the project access road's intersection with Highway 101 to LOS E and cause traffic safety hazards during certain periods in July in 2014. Mitigations recommended for the project will reduce the project's contribution to this impact to a less-than-cumulatively considerable level. As described under Impact 4.4-F, traffic generated by the project would reduce the LOS at the project access road's intersection with Highway 101 to LOS F during certain periods in July and October in 2030. The traffic safety impact would also be worse in that year. Mitigations recommended for the project will reduce the project's contribution to this impact to a less-than-cumulatively considerable level.

Air Quality and Global Climate Change. As discussed in Impacts 4.6-H and 4.6-I, the project will emit greenhouse gases that when combined with emissions from other existing and future development will have an adverse effect on the world's climate. The quantities emitted are relatively small and less than the Mendocino County Air Quality Management District considers significant for a specific project. However, these increased emissions will make it more difficult for the State to meet its targets for greenhouse gas emission reduction. This EIR recommends mitigations to further reduce these emissions, and with these mitigations the cumulative impact would be less than significant. In addition, the discussion of climate change notes that without the project there would be an increase in annual vehicle miles traveled to transport aggregate and asphalt from other existing facilities. Regionally, the project may reduce the emission of

greenhouse gases. Impact 4.6-J discusses the cumulative emission of other air pollutants. However, future emissions and any associated impacts from trucks on Highway 101 will be less than current conditions and the project's contribution to the cumulative impact would be a ***less-than-cumulatively considerable*** contribution.

Visual Impacts on Highway 101. As discussed in Impact 4.7-E, the expansion of the quarry would increase the existing "mined hillside that is the quarry. The project plus the existing operations would constitute a significant and unavoidable cumulative impact on views for northbound travelers on Highway 101.

Future Impacts from Other Potential Processing Facilities. If the proposed Mineral Processing Combining District is approved and added to the County Zoning Ordinance, then owners of up to three other active quarries would be eligible to apply for a rezoning to this district. As is explained in Impact 4.10-D, these requests seem unlikely given the small size and remote location of two of the quarries, and that the third quarry is located between two existing asphalt plants. If one of these owners did successfully receive a rezoning to this new combining zoning district, the construction and operation of processing facilities at or near the quarry would cause a similar range of impacts as described for the Harris Quarry project. However, it is speculative that such applications would be filed, and it is speculative about what the exact impacts would be without knowing the precise location of the facilities and the type of facilities proposed. These site-specific and project-specific impacts would need to be addressed in the required CEQA review that would precede any action on the proposed rezoning. Therefore, the cumulative impacts of any future rezoning request consistent with the proposed new combining zone are speculative.

2.6 Effects Found Not To Be Significant

This section contains a discussion of the environmental effects within the listed areas or resources that were found not to be significant pursuant to the State CEQA Guidelines Section 15128, which provides that "[a]n EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR."

A. Geology and Soils

The project site is not within an Alquist-Priolo Earthquake Fault Zone (EFZ). Expansive soils are often associated with Franciscan bedrock, however the quarrying activities will remove the soil and there will be no structures built upon it, therefore expansive soils are not a significant impact. In the processing plant area, some minor amounts of expansive clay soils may be present. However, the presence of these soils will be a less-than-significant impact when grading the pad for the processing materials. The project is a quarry intended to extract the known mineral resource, therefore, there is no impact as regards eliminating known mineral resources from use. The project would not result in the loss of a mineral recovery site.

B. Hydrology and Water Quality

The project would not construct housing within a 100-year floodplain nor impede flows in such a floodplain. The site is not subject to seiche, tsunami, or mudflows. The site is not subject to failure of a dam or levee. The project would not increase peak runoff from the site and therefore would not significantly aggravate any downstream flooding.

C. Biological Resources

The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, since such ordinances and policies do not exist. The project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan, since there are no such plans adopted that include the project site. The project would convert timberlands to other uses, but required compliance with State laws regarding timberland conversion and eventual site reclamation reduce this impact to a less-than-significant level. Removal of trees could spread Sudden Oak Death syndrome (SOD) off the site. However, compliance with existing County and State regulations for handling woody material from a SOD zone will reduce this impact to a less-than-significant level. Given the size of the remaining property owned by the applicant that would not be developed and compliance with the Migratory Bird Treaty Act, impacts to nests, nursery sites, and wildlife movement would be reduced to a less-than-significant level.

D. Traffic and Circulation

The project would have less-than-significant congestion impacts on future operation of intersections in the area. The project includes two accesses (one for emergency use only), so there is adequate emergency access. The project includes adequate on-site parking. The project would not affect air traffic and therefore would not result in a change in air traffic patterns, including neither an increase in traffic levels nor a change in location that result in substantial safety risks. The project is served by Highway 101, which has no pedestrian or bicycle facilities, and there is no public transit available to the project site. So, any impact to alternate transportation modes would be less than significant.

E. Noise

The project would not expose residents to unacceptable noise levels. The project is not within an area under an airport land use plan. The project is near the CAL FIRE heliport, but noise from use of this heliport would not affect sensitive receptors. As such, there would be no impact per the criterion that addresses airport noise. Project-generated traffic would cause a less-than-significant noise impact along roadways serving the project

F. Aesthetics

The project would not significantly affect views from Federal Wildernesses, the nearest of which is about 15 miles from the site. See the discussion in Section 4.7 regarding impacts on views from other vantage points.

G. Public Services

The project would generate nine new jobs. These additional positions would not result in a significant increase in the number of children that would be educated at local schools. The project would not generate substantial quantities of solid waste, and this generated waste could be handled by existing solid waste transfer stations and receiving landfills. The project would not generate demand for public services, parks, or recreational facilities that would result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives. The project would have a less-than-significant impact on police and emergency medical response.

H. Hazards and Hazardous Materials

The project would not emit any hazardous emissions within one-quarter mile of a school as the nearest school is over one mile away. The site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. The site is not within an area under an airport land use plan. It is near the Howard Forest Helitack station, but discussions with CAL FIRE indicated that any impact to use of that station or impact of the station on the project would be less than significant

I. Land Use

The project would not divide a community as there is no community around the site. The project would not 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. The project would not conflict with a Williamson Act contract, since no such contract exists on the site. The project site does not contain housing, and therefore the project would not displace substantial housing or people, necessitating the construction of replacement housing elsewhere. The project would not result in conversion of dedicated open space into urban or suburban scale development.

J. Cultural Resources

There is no evidence of significant paleontological resources in the project area, and it is not expected that the project would affect such resources.

2.7 Summary of Project Alternatives Analysis

The State CEQA Guidelines require that an EIR include an evaluation of a range of reasonable alternatives to the project that would feasibly attain most of the project

objectives (which are listed in the following Section 3.2-C) while avoiding or substantially reducing any of the significant impacts of the project. Section 5.2 of this EIR contains a full description and analysis of the following seven project alternatives:

1. No Project – No Future Development
2. No Project – Future Development Consistent with Land Use Classification
3. Quarry Only
4. Quarry and Temporary Asphalt Plant
5. Project Redesign
6. Reduced Production
7. Alternate Location

The alternatives have been selected to reduce as many impacts as possible, with emphasis on reducing the remaining four significant and unavoidable visual impacts. The alternatives selected for analysis provide a wide range of alternatives, which can be used to test effects against the proposed project as well as one another. Undoubtedly other combinations of project components and phasing could be developed to create additional alternatives. However, CEQA does not require that every conceivable mix of uses and mitigations be analyzed, but that a range of alternatives be assessed. Seven alternatives is more alternatives than typically assessed in an EIR and should provide decision-makers and the public with sufficient information to understand how alternatives (or portions of alternatives) may reduce or eliminate impacts identified for the project as proposed. If it wishes, the County can select portions of these alternatives and approve a hybrid alternative. The following summarizes the alternatives analysis.

Alternative 1 – No Project – No Future Development

CEQA requires that an EIR address the “no project” alternative. Formerly, the analysis of this alternative assumed no development of the site. Subsequent changes to CEQA require this analysis to discuss existing conditions as well as what can reasonably be 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 1 assess the "no development" scenario," while Alternative 2 addresses no development of the proposed project but future development of the site consistent with current zoning and services.

Description

The existing quarry would terminate operation and be reclaimed per the existing Reclamation Plan (since the permit has now expired), and no future development would occur on the proposed site.

Conclusions

Once the reclamation phase is completed, the No Project Alternative eliminates all the potentially significant impacts of the proposed project except the regional impact of emissions of NOx (nitric oxide and nitrogen dioxide) from haul trucks. There would be an increase in severity for this impact. It is the environmentally superior alternative. However, the alternative does not meet any of the objectives of the project.

The alternative would have secondary effects because it would mean that the aggregate, and asphalt demand for the area would need to be met at other area quarries and processing facilities. Production at these other facilities could have adverse site-specific effects as well as increased regional impacts such as vehicle miles travelled, emission of air pollutants, emission of greenhouse gases, and additional energy use.

The alternative does not meet any of the applicant's five objectives.

Alternative 2 – No Project – Future Development Consistent with Land Use Classification

Description

This alternative would terminate quarry activities and reclaim the quarry site per the existing Reclamation Plan. No improvements would be made on Highway 101. The site is classified and zoned Rangeland with a minimum parcel size of 160 acres. The project property includes about 322 acres. The project site could support one new residence (though perhaps as many as two residences might be constructed on the entire property). For purposes of this EIR analysis and comparison, it will be assumed that one new residence would be developed in or near the location of the asphalt processing facility (since this is the part of the project site with the best access; better views; and quieter than near Highway 101). The other residence would be located to the west with access via Black Bart Drive.

Conclusions

Alternative 2 (No Project – Future Development Consistent with Land Use Classification) eliminates all the potentially significant impacts of the proposed project except the regional impact of emissions of NOx (nitric oxide and nitrogen dioxide) from haul trucks. There would be an increase in severity for this impact. It substantially reduces most other potential project impacts. It results in short-term reclamation of the quarry, and it is environmentally superior to the project as proposed.

The alternative would have secondary effects because it would mean that the aggregate and asphalt demand for the area would need to be met at other area quarries and processing facilities. Production at these other facilities could have adverse site-specific effects as well as increased regional impacts such as vehicle miles travelled, emission of air pollutants, emission of greenhouse gases, and additional energy use.

The alternative does not meet any of the applicant's five objectives.

Alternative 3 – Quarry Only

Description

This alternative includes extension of a 30-year permit for the quarry allowing the production rate requested by the applicant. The alternative would not include construction of the asphalt processing facility or the road to the asphalt processing facility or the new road to the water tank. The recommended Highway 101

improvements would not be part of this alternative, as it is assumed that it would be fiscally infeasible to construct these highway improvements without the revenue generated by the asphalt plant. The alternative would not include the proposed Mineral Processing Combining District. The intent of including this alternative is to allow comparison of the project with an alternative that eliminates the impacts associated with on-site processing of materials and manufacture of asphalt. And an alternative that does not include the extensive Highway 101 improvements.

Conclusions

Alternative 3 (Quarry Only) eliminates the significant and unavoidable visual impacts on views from Black Bart Drive and the night lighting impact. It substantially reduces most other potential project impacts. Because it would not include improvements to Highway 101, it would result in a new significant and unavoidable traffic safety impact. Despite this increased traffic safety impact, the overall reduction in impacts makes this alternative environmentally superior to the proposed project. This traffic safety impact could be eliminated if the County decided to approve a hybrid Alternative 3 that includes the same highway improvements that are required for the proposed project.

The alternative would have secondary effects because it would mean that asphalt demand for the area would need to be met at other area quarries and/or processing facilities. Production at these other facilities could have adverse site-specific effects as well as regional impacts including additional vehicle miles traveled, which results in increased emission of air pollutants and greenhouse gases and increased consumption of diesel fuel. The significant project impact associated with NOx emissions would be greater for this alternative.

The alternative meets two project objectives (operating the quarry for 30 years and at the expanded production rate of up to 200,000 cubic yards per year).

Alternative 4 – Quarry and Temporary Asphalt Plant

Description

This alternative includes all elements of the proposed project except the asphalt processing facility would be issued a temporary use permit that extends for the period that the Willits Bypass is being constructed. The County Zoning Ordinance (Section 20.036.010) currently allows mineral processing "of a temporary nature and carried on in conjunction with, and only for the duration of a specific construction project…" The installation of such a temporary facility would require County approval of a use permit. Based on discussions with Phil Dow of the Mendocino Council of Governments, the bypass, if funding is restored, is projected to take about 4 years to construct.[1] This alternative would include a zoning variance to allow the asphalt silo to be 75 feet high. The alternative would modify the proposed Mineral Processing Combining District to allow only temporary asphalt production for one discrete project not exceeding one 5-year period during the 30-year permit process. Alternatively, the new zoning district could be eliminated (since County zoning does allow this limited processing use), and the time limits described in the previous section would be included in the Use Permit.

[1] Phil Dow, MCOG Director, personal communication, 7/10/07.

The asphalt facility site would be reclaimed after 5 years consistent with the Reclamation Plan for the proposed project. The intent of including this alternative is to allow comparison of the project with an alternative that meets most of the project objectives but eliminates the long-term impacts from the asphalt facility.

Conclusions

Alternative 4 (Quarry and Temporary Asphalt Plant) would reduce the impacts associated with the making of asphalt since the asphalt plant would only be allowed to operate for a maximum of five years of the 30-year permit. The main advantage of this alternative is that a major industrial use would not be a permanent facility in the rural environment. It would reduce the two significant visual impacts to Black Bart Drive to a less-than-significant level. It would substantively reduce noise and air quality impacts.

It is possible that a smaller pad would be needed for a temporary asphalt plant. If that were the case, there would be a reduction in a range of impacts, including soil erosion, slope stability, increased runoff, potential for water pollution, loss of native vegetation, and visual impacts.

The alternative would be environmentally superior to the project as proposed. The alternative meets two of the applicant's five objectives (maintain the quarry and expand the maximum rate of production), and partially meets three other objectives (develop an asphalt facility, locate processing facilities adjacent to the quarry, and locate the project in a central location between Willits and Ukiah).

Alternative 5 – Project Redesign

Description

This alternative includes the project as proposed including all EIR-recommended mitigation measures. In addition, it includes the following two elements:

- Nighttime activities will not be allowed more than 20 nights a year to serve a major road construction project; the County would need to authorize this nighttime use. The applicant has requested the ability to operate at night up to 100 nights a year. The rationale for such a request appears to be that Caltrans might request nighttime operations when constructing the Willits Bypass in order to minimize traffic congestion impacts. However, it is speculative that nighttime operations would be needed for a new bypass around the City. In fact, nighttime operations might be very unpopular with people living near the bypass route. In any case, this alternative limits nighttime operations to 20 nights a year.

- The applicant will finance their fair share of construction of at least a partial interchange at the project access driveway intersection. At a minimum, this partial interchange would include northbound on and offramps with a highway overcrossing; these improvements would eliminate turns in or out of the quarry across oncoming traffic. Southbound turns into or out of the quarry could either be via the deceleration and acceleration lanes as recommended for the project in this EIR, or the interchange could be fully developed to also include southbound

on and offramps. It is expected that Caltrans would require connection of Black Bart Drive to this interchange.

The intent of including this alternative is to allow comparison of the project with an alternative that meets most project objectives and further mitigates project traffic and visual impacts.

Conclusions

Alternative 5 (Project Redesign) reduces the significant and unavoidable visual impacts of night lighting of the processing facilities to a less-than-significant level. It eliminates existing and future traffic safety impacts. It reduces nighttime noise impacts. It is environmentally superior to the project as proposed. The alternative meets all of the applicant's five objectives.

Alternative 6 – Reduced Production

Description

This alternative allows expansion of the mining area but limits the maximum production rate to the existing limit of 75,000 cubic yards per year for 30 years. The alternative does not include the asphalt plant, Highway 101 widening, or the new combining district zoning. The intent of including this alternative is to allow comparison of the project with an alternative that maintains existing use of the site and partially meets the applicant's project objectives.

Conclusions

Alternative 6 (Reduced Production) eliminates the significant and unavoidable visual impacts on views from Black Bart Drive and the night lighting impact. It substantially reduces most other potential project impacts. It eliminates any future impacts associated with development of processing facilities at other quarries in the County in the Range Land classification.

The alternative would have secondary effects because it would mean that asphalt demand for the area would need to be met at other area quarries and/or processing facilities. Production at these other facilities could have adverse site-specific effects as well as regional impacts including additional vehicle miles traveled, which results in increased emission of air pollutants and greenhouse gases and increased consumption of diesel fuel.

The alternative meets one (maintaining the quarry operations) of the applicant's five objectives.

Alternative 7 - Alternate Location

Description

The only alternate site where the whole project could occur is Blue Ridge Rock Quarry in southern Mendocino County, but the site is not for sale. The EIR identifies other sites where the applicant could seek County or City of Willits approval for an asphalt plant. The discussion includes possible temporary siting of an asphalt plant in the Highway 101 right-of-way to be used for constructing the Willits Bypass.

Conclusions

There is no feasible alternative site for the project as a whole. If the County decided to approve an alternative that did not include the asphalt facility, then there are alternative sites the applicant could seek to purchase and get approval for operation of an asphalt facility. However, all these sites are more urbanized (despite having industrial land use designations) than the proposed site and could result in land use conflicts with residential neighbors living in the area. Development of these sites would have their own environmental effects, including more significant traffic impacts for the possible alternate sites in Willits and Ukiah than for the proposed project site. It is entirely possible that there are other available sites that were not listed on the Multiple Listing Service. However, most land designated Industrial is within or near Ukiah, Calpella, and Willits. In almost all cases, these lands are fairly near existing residential development.[2] The County could not approve an asphalt plant at any of these sites as part of this EIR. A separate application would need to be submitted, and it would need to undergo its own detailed environmental review. If the County believes that an alternate site for the asphalt plant is preferable, then it can approve one of the earlier alternatives that eliminates the asphalt plant. The earlier discussions indicate that all alternatives that eliminate the asphalt facility are environmentally superior to the proposed project.

Comparison of Alternatives

There are 8 alternatives under consideration: the 7 alternatives discussed above and the project as proposed. Table 2-1 compares the impact significance for the project and the alternatives.

Alternative 1 (No Project – No Further Development) is the environmentally superior alternative as it eliminates all site-specific impacts and allows immediate reclamation of the existing quarry, even though it would somewhat increase regional traffic, air quality, climate change, and energy use impacts.

[2] A commenter on the original DEIR asked a series of questions about how much effort went into identifying alternative sites. The EIR preparers requested information on available sites from seven local realtors and reviewed the on-line MLS listings for the target area. It is possible that there may be other sites that are available and meet the criteria of size and land use designation. However, CEQA does not require an EIR to identify every possible alternate site. In addition, if other feasible sites are identified during the public review of this DEIR, they will be addressed in the Final EIR.

CEQA requires that a second environmentally superior alternative be identified if the environmentally superior alternative is the no project alternative (i.e., Alternatives 1 or 2). Alternative 6 (Reduced Production) would be the environmentally superior alternative among the remaining alternatives. Alternative 6 eliminates two of the five potentially significant impacts of the project. It substantially reduces many other impacts, though it would somewhat increase regional traffic, air quality, climate change, and energy use impacts. This alternative meets 1 of the 5 project objectives.

The following list ranks the alternatives. Alternative 1 is environmentally superior while the project as proposed is the least "superior:"

Alternative 1 No Project – No Future Development
Alternative 2 No Project – Future Development Consistent with Land Use Classification
Alternative 6 Reduced Production
Alternative 3 Quarry Only
Alternative 4 Quarry and Temporary Asphalt Plant
Alternative 5 Project Redesign
Project as Proposed

If the County determines that the Alternative Location alternative (Alternative 7) is superior, then it would select one of the other alternatives that eliminates the asphalt plant on the proposed site.

2.8 Summary of Major Conclusions and Issues to Be Resolved

The following major conclusions and issues to be resolved can be derived from the analysis in this EIR. The major conclusions of the EIR are presented first, followed by the issues to be resolved. The issues are presented to highlight the topics for which the decision-makers may want to focus special attention. See Table 2-2.

1. The EIR identified a total 30 potentially significant adverse impacts that would result from project development, as well as 6 cumulative impacts and one secondary impact resulting from implementing EIR-recommended mitigations. Feasible mitigation is available to reduce all of these impacts to a less-than-significant level except for four visual impacts and the impact on air quality from increased emission of NOx from haul trucks.

2. The project will require constructing a large fill pad to support the asphalt plant as well as large cuts to construct access roads and the quarry expansion. If these cuts and fills are not properly designed and constructed, they could fail thereby potentially harming workers and resulting in discharge of sediments and possibly hazardous materials to Forsythe Creek or its tributary. This EIR contains a list of mitigation measures to prevent such impacts. The large fill pad will be required to meet standards established in this EIR to ensure its integrity. With successful implementation of these recommended mitigation measures, the slope stability impacts can be reduced to a less-than-significant level.

3. Construction of the project and expanded mining can create soil erosion which can discharge sediments to Forsythe Creek, thereby adversely affecting water quality and habitat for salmonids. The project also requires the transport, storage, and use of petrochemicals and other materials that, if not properly stored and handled, could escape the site and adversely affect water quality of Forsythe Creek. This EIR recommends mitigations to control erosion and to store and use potentially hazardous materials so that they would not escape the site under both normal conditions or during expected seismic events. With successful implementation of these recommended mitigation measures, the potential water quality impacts can be reduced to a less-than-significant level.

4. The project will increase the use of water drawn from the applicant's well to provide water for the project. There is adequate water to meet the projected demand, and the increased water use will not significantly affect neighboring wells or springs.

5. The project will convert oak woodland to other uses. The EIR recommends mitigation measures to reduce this impact to a less-than-significant level per the requirements of State Public Resources Code Section 21083.4.

6. The project and recommended highway widening will result in filling of 0.04 acres of wetlands and 1,400 square feet of stream channel. The EIR recommends mitigation measures that will compensate for the loss of these resources, and the impact can be reduced to a less-than-significant level.

7. The project will increase the number of trucks turning on and off Highway 101 at the project access driveway. This will substantially increase the existing safety hazard involving potential conflicts between slow-moving and turning trucks and other motorists on the highway. The EIR recommends improvements to Highway 101. Even with these recommended improvements, there remains some potential for vehicle conflict between trucks turning north onto Highway 101 conflicting with drivers entering the left-turn lane (which is also the recommended northbound acceleration lane) to Black Bart Drive. Nevertheless, the recommended highway improvements will substantially improve the overall safety of the existing intersection to a level that is safer than existing conditions. This increased overall safety outweighs the impact of the increased traffic generated by the project and the remaining potential conflict noted above. Other mitigations would address the hazards of truck turns during periods of limited visibility and at night. These mitigation measures would reduce traffic safety impacts to a less-than-significant level.

8. The quarry and asphalt processing facility will generate noise. The noise impacts are predicted to be below acceptable County noise thresholds and would be less than significant. However, there are times when noise from the asphalt processing facility may be audible to residents living to the west.

Table 2-1
Comparison of Alternatives to the Proposed Project

Project as Proposed with EIR Mitigations	Alternative 1 – No Project – No Future Development	Alternative 2 – No Project Future Use Consistent with Land Use Classification
Description		
• Allow extraction of 200,000 CY/year • Develop asphalt facility on–site • Allow asphalt facility to operate up to 100 nights per year • Make safety improvements to Highway 101 • Add Mineral Processing Combining District	• No future development of the quarry or addition of processing facilities • No combining district added to the zoning ordinance	• No future development of the quarry or addition of processing facilities • Develop 2 lots where homes would be built • No combining district added to the zoning ordinance
Results of Analysis		
Advantages • Long-term expansion of quarry and increased production of mineral resources • Production of on-site asphalt materials • Safety improvements to Highway 101 • Decreased regional highway traffic miles travelled and emissions of air pollutants and greenhouse gases Disadvantages • Results in 37 potentially significant and 5 significant and unavoidable impacts identified in this EIR	Advantages • Eliminates all site-specific project impacts • Results in immediate reclamation of existing quarry site • Eliminates potential adverse impacts at other eligible quarry sites in the Range Land classification Disadvantages • Aggregate and asphalt would be produced at other quarries and facilities in the area or outside the area • Could result in more cumulative, regional vehicle miles travelled on Highway 101 and air pollutant and greenhouse gas emissions and energy use from that traffic	Advantages • Reduces the significant and unavoidable visual and air quality impacts to less-than-significant levels • Substantially reduces most other potentially significant impacts • Eliminates potential adverse impacts at other eligible quarry sites in the Range Land classification Disadvantages • Aggregate, asphalt would be produced at other quarries and facilities in the area or outside the area • Could result in more cumulative, regional vehicle miles travelled on Highway 101 and air pollutant and greenhouse gas emissions and energy use from that traffic
Conclusions		
• Not environmentally superior • Meets all project objectives	• Environmentally superior • Does not meet any project objectives	• Not environmentally superior • Does not meet any project objectives

Table 2-1 (continued)
Comparison of Alternatives to the Proposed Project

Alternative 3 – Quarry Only	Alternative 4 – Quarry and Temporary Asphalt Plant	Alternative 5 – Project Redesign
Description		
• Expansion of quarry as proposed • No asphalt plant • No combining district added to the zoning ordinance • No highway improvements	• Project as proposed except that asphalt facility is allowed for one 5-year period over 30 years • The combining district would allow only temporary asphalt facility use	• Project as proposed with the inclusion of all EIR-recommended mitigation measures • Nighttime operations of asphalt plant would be limited to 20 nights a year • Interchange at the project access would be built
Results of Analysis		
<u>Advantages</u> • Eliminates two significant and unavoidable visual impacts • Substantially reduces most other impacts • Eliminates potential adverse impacts at other eligible quarry sites in the Range Land classification <u>Disadvantages</u> • Could result in more cumulative, regional vehicle miles travelled on Highway 101 and air pollutant and greenhouse gas emissions and energy use from that traffic • Result in a new significant and unavoidable traffic impact on Highway 101 at the access driveway	<u>Advantages</u> • Reduces the period of time that potentially significant traffic, noise, air quality, and visual impacts from the asphalt plant would occur • Ensures that an asphalt plant is not a permanent facility in a rural environment <u>Disadvantages</u> • Could result in more cumulative, regional vehicle miles travelled on Highway 101 and air pollutant and greenhouse gas emissions and energy use from that traffic	<u>Advantages</u> • Eliminates one significant and unavoidable visual impact • Eliminates all existing and future traffic safety impacts • Reduces most other impacts <u>Disadvantages</u> • Otherwise results in the same impacts identified in this EIR
Conclusions		
• Not environmentally superior • Meets 2 of the 5 project objectives	• Not environmentally superior • Meets 2 of the 5 project objectives and partially meets 3 of the remaining objectives	• Not environmentally superior • Meets all 5 project objectives

Table 2-1 (continued)
Comparison of Alternatives to the Proposed Project

Alternative 6 – Reduced Production	**Alternative 7 – Alternate Location**
Description	
• Expansion of quarry as proposed with a reduced maximum production rate of 75,000 CY per year • No asphalt plant • No highway improvements • No new combining district	• Adoption of one of the other alternatives that does not include the asphalt plant, and the asphalt plant would be developed at an alternate site
Results of Analysis	
<u>Advantages</u> • Reduces two significant and unavoidable visual impacts • Substantially reduces most other impacts • Avoids any potentially significant impacts of developing processing facilities at other eligible quarry sites in the Range Land classification <u>Disadvantages</u> • Could result in more cumulative, long-term truck traffic on Highway 101 and air pollutant and greenhouse gas emissions from that traffic	<u>Advantages</u> • Eliminates asphalt plant-specific impacts at the proposed site • Alternate asphalt plant sites could eliminate land use conflicts and impacts affecting the local community <u>Disadvantages</u> • Alternate sites could have significant impacts on the local environment greater than at the proposed site • Could result in more cumulative, long-term truck traffic on Highway 101 and air pollutant and greenhouse gas emissions from that traffic
Conclusions	
• Not environmentally superior • Meets 1 of the 5 project objectives	• Not applicable – other alternatives address the quarry portion of the project; it is speculative what the effects of constructing an asphalt plant at another location would be, and that project would need to undergo a separate CEQA review

9. The quarry will emit dust (small particulates) and other air pollutants. With one exception, after implementation of EIR-recommended mitigation measures, these emissions would not cause an exceedance of local, State, or Federal air quality standards. The exception is the emission of NOx from haul trucks transporting aggregate and asphalt from the project site. These NOx emissions exceed the Mendocino Air Quality Management District's significance threshold for new projects. As such, this would be a significant and unavoidable impact of the project. However, modeling of traffic shows that the project would reduce the total regional vehicle miles traveled in the County - due to the proximity of the proposed asphalt plant to the aggregate source and the proximity of the project site to markets. Modeling shows that on a regional basis the project would result in less emission of NOx and other air pollutants than if these products were continued to be produced at other existing quarries and asphalt plants.

10. The asphalt plant will emit pollutants, toxic air contaminants, and odors that potentially cause health or nuisance problems. With implementation of EIR-recommended mitigation measures, these emissions from the asphalt plant will be below local, State, or Federal air quality significance thresholds. The health and odor impacts as assessed per adopted or recommended significance thresholds would be reduced to a less-than-significant level. However, there will be some emissions of pollutants into the air.

11. The quarry will emit carbon dioxide and nitrogen oxide, which are greenhouse gases, thereby incrementally contributing to global climate change. The emissions are below the significance threshold used by the Mendocino Air Quality Management District. Nevertheless, this EIR recommends mitigations to further reduce greenhouse gas emissions. The impact would be less than significant.

12. The expanded quarry will have significant and unavoidable adverse impacts on views from Highway 101 and a few vantage points on Ridgewood Ranch. The asphalt processing facility will have a significant and unavoidable adverse impact on views from Black Bart Drive and residential vantage points on the Ridgewood Subdivision. Night lighting of the asphalt processing facility would also have a significant and unavoidable impact on views from Black Bart Drive and residential vantage points on the Ridgewood Subdivision.

13. The storage of petrochemicals and other processing materials would cause a potential fire hazard and health hazard. However, storage and use of these materials consistent with Federal, State, and County requirements and the mitigation measures recommended in this EIR would reduce this potential health and safety impact to a less-than-significant level.

14. Locating the asphalt plant at the quarry site would reduce truck traffic on Highway 101 and thereby reduce the use of diesel fuel.

15. The project would add a new Mineral Processing Combining District that could apply to properties with mineral resources that are zoned Rangeland. Such processing facilities would be allowed only within 0.5 miles of a mine with vested rights or a County-permitted quarry. This EIR concludes that there are three

other active quarries that are eligible for this new combining district, and only one quarry that has available supplies, permitted production capacity, access, and location that might apply for such a rezoning. Any future request for rezoning would need to undergo CEQA review, and the County could approve the rezoning only after reviewing the CEQA analysis of impacts. Whether owners of any of the three eligible quarries would seek a similar rezoning and the actual impacts from developing processing facilities at other quarries remain speculative at this time.

See the Summary of Project Alternatives in Section 2.7 above for a summary of the project alternatives and how they may further reduce project impacts.

Issues to Be Resolved

This EIR identifies 30 potentially significant adverse impacts that would result from project development, as well as 6 cumulative impacts and one secondary impact resulting from implementing EIR-recommended mitigations. The primary issue to be resolved is whether the Mendocino County Board of Supervisors, as the principal decision-making body for the project, should adopt the project as proposed or adopt an alternative such as the Reduced Production alternative evaluated in this EIR.

To resolve this issue, the Board of Supervisors needs to review and consider the Draft EIR evaluations and the mitigation measures recommended to reduce impacts to less-than-significant levels. Mitigation measures for significant effects can be adopted as conditions of approval by the Board of Supervisors.

The Board will need to determine whether to adopt the proposed change to the Zoning Ordinance. In doing so, it must determine whether allowing mineral processing in the Range Land land use classification and zoning is an acceptable use within that classification and zoning, and whether industrial processing should be an allowed use in areas where residential uses may be located nearby.

Because the project would have five significant and unavoidable impacts (see Section 2.3 above), the Board of Supervisors is required to make findings describing why the proposed project, rather than an alternative, would be approved. In accordance with CEQA Guidelines Section 15093, the Board would need to adopt a Statement of Overriding Considerations that sets forth in writing the reasons for approving the project despite the significant and unavoidable environmental impacts that may result. When considering the merits of the project, the Board of Supervisors may use data in the EIR to support the approval of a project alternative.

If the Board of Supervisors does not include mitigations recommended in this EIR, then the potentially significant impacts those measures are intended to mitigate would be judged as additional remaining significant and unavoidable adverse impacts, and the Board would need to adopt a Statement of Overriding Considerations for those impacts.

2.9 Summary Table of Impacts and Mitigations

Table 2-2 summarizes the project impacts and the mitigation measures recommended to address those impacts. The first column of Table 2-2 describes the impact that would result from the project. Following that impact is a description of the level of significance that impact has. Levels of significance include: "beneficial" (listed as B in the table), "less than significant" (listed as LTS in the table), “less than cumulatively considerable” (listed as LTCC in the table),"potentially significant" (i.e., significant prior to implementation of mitigation measures; listed as PS in the table), or "significant" (listed as S in the table).

The next column lists the recommended mitigation measures for the impact. Finally, there is a column that describes the significance of the impact after mitigation measures have been implemented.

TABLE 2-2- IMPACT AND MITIGATION SUMMARY

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
4.1	**Geology and Soils**			
4.1-A	Quarry activities could result in unstable slopes.	PS	4.1-A.1 Prior to the start of the second year of grading in the quarry expansion area, and annually thereafter, a licensed Geotechnical Engineer and Certified Engineering Geologist shall inspect the slopes of the quarry excavation and perform a slope stability evaluation. The evaluation shall determine whether the excavated quarry face meets the slope stability performance criteria, which are a minimum pseudo-static factor of safety of greater than or equal to 1.1, and a static factor of safety of greater than or equal to 1.4. The evaluation shall include a determination 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 potential static and dynamic quarry slope conditions shall be consistent with the provisions of the California Division of Mines and Geology Guidelines for Evaluating and Mitigating Seismic Hazards (CGS Special Publication [SP] 117, 1997). In the event that the evaluation determines that the slopes do not meet the slope stability performance criteria, the evaluation shall include recommendations for revisions to the grading plan that will ensure compliance with the criteria. 4.1-A.2 The uppermost 20-foot quarry cut shall be sloped no steeper than 1.5h:1v in accordance with recommendations of the report prepared by Blackburn Consulting (Cut Slope Evaluation for Harris Quarry Haul Road (BCI) February 2007, with addendum dated July 2008). 4.1-A.3 Final cut slopes on the quarry walls shall be cut at the gradient required to attain a factor of safety of 1.3, with intervening 12-foot benches every 40 vertical feet.	LTS
4.1-B	Unstable geology and slopes at the asphalt processing facility site could cause failure of improvements at that site.	PS	4.1-B.1 A Certified Engineering Geologist and a Geotechnical Engineer shall be identified to conduct the mitigation measures recommended below. The choice of Certified Engineering Geologist and Geotechnical Engineer shall be approved by the County Department of Planning and Building Services. 4.1-B.2 The processing building pad will be designed and constructed to be stable for the maximum credible earthquake for the area. A	LTS

Note: B = Beneficial Impact; PS = Potentially Significant Impact; LTS = Less Than Significant Impact; SU = Significant Unavoidable Adverse Impact; LTCC = Less Than Cumulatively Considerable

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		design-level Geotechnical Investigation shall be performed in the area of the proposed asphalt processing area that will identify design measures needed to ensure building pad stability, including for the design seismic event. The following will be included in the design-level Geotechnical Investigation. 1) The investigation shall specifically address the feasibility and long-term stability of 1h:1v cut slopes and 1.5h:1v fill slopes. A slope stability analysis of proposed cut and fill slopes will be performed. Recommended maximum gradients for cut slopes and engineered fill slopes required to maintain a 1.3 static factor of safety will be determined. 2) The potential for generating landslides and other mass wasting in the underlying geologic materials from loading with fill soils on slopes and removal of toe support in cut slopes shall be evaluated. 3) The potential for settlement shall also be addressed and the analysis shall include characterization of gross settlement, differential settlement, and dynamic (earthquake induced) settlement within and between adjacent materials. The study will include design recommendations for structural footings and foundations to minimize future settlement. 4) Specific design mitigation measures for long-term stability of the cut and fill slopes shall be developed. These mitigation measures are anticipated to include construction of bedrock keyways underlying all fill slopes, installation of subsurface drainage measures to drain the contact between underlying bedrock/soils and overlying engineered fill soils, the use of Geogrid stabilization fabrics in the engineered fill to allow for construction of stable slopes at slope steepness greater than 2h:1v, and other design measures as identified by the Certified Engineering Geologist and Geotechnical Engineer of record for the project. 5) Design Review and Approval of Plan Sheets will be done by the Mendocino County Public Works and Building Departments to ensure conformance with	

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		Grading and Drainage Ordinances and the recommendations of the final geotechnical report. 6) Construction observation and testing (special inspections) will be done during construction to ensure conformance with design requirements and geotechnical recommendations. 4.1-B.3 The site of proposed fills in the west-southwestern portion of the expansion area will also be evaluated and appropriate measures to stabilize proposed fills shall be determined and incorporated into project design, consistent with the requirements of Section 3704(d) of the State Mining and Geology Board Reclamation Regulations. Proposed fills shall be properly compacted to a minimum 90% compaction relative to the maximum dry density and shall be no steeper than 2h:1v unless measures to reinforce the fills are included in project plans and a slope stability analysis is completed by the Project Geotechnical Engineer and Certified Engineering Geologist which finds that proposed fills will be stable.	
4.1-C	The project site is subject to seismic events and strong seismic ground shaking.	PS	The mitigations recommended for Impacts 4.1-A and 4.1-B also apply to this impact.	LTS
4.1-D	The new access road and the new road to the water tank could fail if not properly constructed.	PS	4.1-D.1 A Certified Engineering Geologist and a Geotechnical Engineer shall be identified to conduct the mitigation measures recommended below. The choice of Certified Engineering Geologist and Geotechnical Engineer shall be approved by the County Department of Planning and Building Services. 4.1-D.2 A design level Geotechnical Investigation shall be performed in the area of the proposed road cuts at the quarry entrance road and on proposed cuts along the access road to the water tank that will identify design measures needed to ensure building pad stability, including for the design seismic event. The investigations shall specifically address the feasibility and long-term stability of 1.5h:1v cut slopes for the main access road and 1h:1v cut slopes for the water tank access road. The potential for generating landslides and other mass wasting in the underlying geologic materials from removal of toe support in cut slopes shall be evaluated. Specific design mitigation measures for long-term stability of the cut slopes shall be developed. These mitigation measures are anticipated to include	LTS

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		construction of bedrock keyways underlying all fill slopes, installation of subsurface drainage measures to drain the contact between underlying bedrock/soils and overlying engineered fill soils, the use of Geogrid stabilization fabrics in the engineered fill to allow for construction of stable slopes at slope steepness greater than 2h:1v, and other design measures as identified by the Certified Engineering Geologist and Geotechnical Engineer of record for the project. 4.1-D.3 The Geotechnical Investigation shall include slope stability analysis for the proposed road cuts to confirm that the proposed slopes meet minimum standards of stability such as factor of safety calculations. This study shall be performed by a Certified Engineering Geologist or Geotechnical Engineer. 4.1-D.4 Anticipated recommendations from the geotechnical investigations and slope analyses will include maximum proposed cut slope steepness which may vary from the proposed design, slope stabilization measures such as retaining walls, and other methods that may be identified during the slope stability analysis. Recommendations may also include alternative designs such as biotechnical engineering techniques, gravity walls, buttress fills, reinforced fills, and other slope stabilization techniques. 4.1-D.5 A Civil Engineer shall design any required retaining walls, gravity walls, buttress fills, or other slope stabilization technique in accordance with recommendations of the geotechnical investigations and slope stability analysis and in accordance with County and State Guidelines. 4.1-D.6 An erosion control plan and planting plan shall be developed for stabilization of any soils excavated or exposed during construction activities.	
4.1-E	The proposed on-site wastewater disposal system could fail due to inadequate soils.	LTS	No mitigation beyond complying with existing laws and regulations is needed.	LTS
4.1-F	Improper construction and operation of the project could result in soil erosion and the loss of topsoil.	PS	The project shall comply with Mitigation Measures 4.2-A.1 through 4.2-A.6 and 4.2-B.1 through 4.2-B.4.	LTS
4.1-G	*Cumulative Impact* - Future expansion of the quarry could result in unstable slopes.	LTCC	No mitigation is required.	LTCC

TABLE 2-2 - IMPACT AND MITIGATION SUMMARY
(Continued)

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
4.2	**Hydrology and Water Quality**		
4.2-A Stormwater runoff containing sediments, metals, dust suppressants, total petroleum hydrocarbons, oil and grease, and other pollutants associated with mining activities and vehicle and equipment use would potentially violate water quality standards and/or impact habitat.	PS	4.2-A.1 The project shall comply with the RWQCB's Construction General Permit conditions. 4.2-A.2 The applicant shall not cause or contribute to a violation of an applicable water quality standard. The applicant shall comply with the NPDES Permit Requirements for the Industrial General Permit (Order No. 97-03-DWQ). The specific elements of this mitigation measure are: *Water Quality Monitoring and Sampling* The applicant shall develop and implement a facility-specific monitoring program to provide indicator monitoring information for the following: (1) BMPs addressing pollutants in stormwater discharges and authorized non-stormwater discharges comply with the Discharge Prohibitions, Effluent Limitations, and Receiving Water Limitations of this General Permit, (2) the presence of pollutants (and their sources) in stormwater discharges and authorized non-stormwater discharges that may require immediate corrective action, additional BMP implementation, or SWPPP revisions, and (3) the effectiveness of BMPs to prevent or reduce pollutants in stormwater discharges and authorized non-stormwater discharges. The applicant shall be required to: 1. Collect and analyze stormwater samples from the first two qualifying storm events of the wet season. Analysis must include: (a) the minimum indicator parameters: pH, total suspended solids (TSS), total organic carbon (TOC) or Oil and Grease, and specific conductance, (b) parameters that indicate the presence of materials that are mobilized by contact with stormwater (such as rock salt) and are likely to be exposed to stormwater (based upon the discharger's pollutant source assessment required in the SWPPP), (c) parameters listed in Table VIII "Additional Analytical Parameters" (these parameters are dependent on the facility's SIC code), and (d) parameters indicating the presence of industrial materials that may be causing or contributing to an	LTS

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		exceedance of a water quality standard in the receiving waters. Water sampling shall be conducted by a third-party consultant and water samples shall be submitted to a California-certified analytical laboratory for analysis. 2. Visually observe the facility before every anticipated storm event to locate and manage obvious pollutant sources. The Industrial General Permit requires dischargers to collect samples from all drainage areas. The following actions are required: 1. Facility operators shall visually observe and collect samples of stormwater discharges from all project drainage areas. The samples shall represent the quality and quantity of the facility's stormwater discharges from the storm event. 2. If the facility's stormwater discharges are commingled with run-on from surrounding areas, the facility operator shall identify other visual observation and sample collection locations where project discharges have not been commingled by run-on and that represent the quality and quantity of the facility's stormwater discharges from the storm event. 3. If visual observation is not possible or sample collection locations are difficult to sample (e.g., sheet flow, submerged outfalls), facility operators shall identify and collect samples from other locations that represent the quality and quantity of the facility's stormwater discharges from the storm event. 4. If facility operators determine that the industrial activities and BMPs within two or more drainage areas are substantially identical, they may either (i) collect samples from a reduced number of substantially identical drainage areas, or (ii) collect samples from each substantially identical drainage area and analyze a combined sample from each of these drainage area. Facility operators must document such a determination	

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		in the annual report. Sample collection sites shall include, at a minimum: 1. Due to the steep slope and associated inaccessibility for sampling at the existing 36-inch CMP outfall from the existing sump pond at the southeast corner of the quarry site, another point upstream shall be used for sampling. This location shall be the outlet of the proposed 48-inch pipe entering the sump pond, or sampling can be conducted via installation of a vertical CMP clean-out in the proposed 48-inch pipe within the quarry site. 2. Outfall of the proposed 12-inch pipe outlet for the bio-retention area at the processing site. All associated records of stormwater quality monitoring, sampling, and analyses shall be retained and submitted per RWQCB permit requirements. The applicant shall submit a monitoring report to the RWQCB with a copy submitted to the County Department of Planning and Building Services. Frequency of reporting shall be determined by the RWQCB but shall not be less frequent than twice each rainy season. The qualified water quality professional conducting the monitoring shall provide an analysis of the data and an evaluation of the overall effectiveness of the sediment control system. If the water quality objectives have been exceeded, the report shall include analysis as to the specific causes of the exceedances and recommended measures to bring the discharges into compliance. 4.2-A.3 If necessary, implement corrective measures to meet water quality objectives. Once mining commences, if annual surface water monitoring indicates that discharges from the quarry exceed the water quality objectives, the applicant shall propose changes to the sediment control program that will improve its performance sufficiently to meet the performance criteria. Corrective action may include, but is not limited to, implementation of additional source control BMPs, use of chemical flocculation, installation of mechanical filtration of the discharge, and/or construction of extended wet ponds and/or treatment wetlands. The proposed changes shall be submitted to the RWQCB for comment, revised as needed to address their comments, and then implemented by the applicant. If the	

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		performance criteria are not met for two consecutive years, the County Department of Planning and Building Services will confer with the applicant and the RWQCB to determine whether further changes in the sediment control plan are likely to result in compliance. If suitable changes are not identified, then the County shall require the quarry to reduce production as needed to meet the performance criteria. 4.2-A.4 The applicant shall revise and implement an updated Storm Water Pollution Prevention Plan (SWPPP) for the project. The erosion control portion of the SWPPP shall include an aggressive sediment source and delivery control program. It shall place greater emphasis on establishing temporary and permanent protection of disturbed fill slopes and drainages in the processing areas that drain to Forsythe Creek. Most importantly the plan must include an annual winterization report that documents the location and application of best management practices to mitigate reduction in water quality due to sediment in storm runoff. The SWPPP shall be regularly updated as BMPs are updated and new BMPs are constructed and/or the quarry operation changes. The SWPPP shall be implemented during the initial stage of quarry construction and stay in effect through the completion of reclamation. The required detailed SWPPP, including the erosion control plan shall also include: 1. A formal plan for preventing the inadvertent side cast of materials from the quarrying area entering Forsythe Creek and its tributary shall be developed. 2. All fill slopes draining to Forsythe Creek shall be stabilized prior to October 15 of each year. The plan shall include a detailed design plan for annual stabilization. Stabilization measures include fill slopes suitable for hydraulic application of surface stabilizing compounds, hydroseeding, mulching, or other measures to prevent erosion, and the application thereof. It shall include a description of the erosion control materials to be used and application rates. Seed mixes shall be specified. A schedule for completion of stabilization shall be included, and the stabilization shall be completed by October 15 each year.	

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		3. Silt fences, fiber rolls, and straw bale barriers shall be used on bare slopes not being actively mined to intercept and trap sediment carried by sheet flow. 4. The site plan shall show work areas, indicating the year the initial reclamation occurred, active mining, stockpiling, work areas, and areas to be mined the following year. 5. The site plan shall show erosion and drainage problem areas, and proposed emergency stormwater runoff flow directions, in addition to the planned retention, bio-retention, and treatment areas. 6. The applicant shall place all hazardous materials and fueling areas above predicted 100-year 24-hour flood elevations and above observed seasonal high-water elevations. 7. A plan to annually monitor and treat stormwater outlets that discharge to slopes and drainages to insure that gullying, incision, or other erosion and mass wasting processes are not occurring as a result of project area operations and site drainage will be implemented. 4.2-A.5 During mining and reclamation activities, the following measures shall be included in the SWPPP required under the General Construction Permit and implemented to reduce the potential for erosion and sediment discharge: 1. Topsoil suitable for use in revegetation shall be stockpiled in a stable manner 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. Topsoil shall be stored in locations that are not immediately above or adjacent to stream drainages. 2. Benches shall drain into adequately sized pipes or rock-lined channels that convey the runoff to the quarry floor. Outlets of pipes shall have appropriate energy dissipaters to prevent erosion at the outfall.	

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		4.2-A.6 The applicant shall implement best management practices to reduce the potential for discharge of contaminants to stormwater runoff. These BMPs shall be included in the General Construction Permit SWPPP and shall be designed by a civil engineer, and the design engineer shall oversee BMP installation. To minimize the introduction of contaminants, which may degrade the quality of water discharged from the site, the following measures shall be taken: • Runoff from all access roads shall be collected and passed through a treatment swale or trap system prior to entering the existing or planned drainage features for the highway improvements that outfall to the secondary channel of the Forsythe Creek tributary. Ditch flow shall not exceed 100 feet of concentrated flow. • 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 releases of hazardous material. 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. • All chemical dust suppressants, slope stabilization chemicals or polymers, and sediment detention basin enhancement chemicals or polymers shall be used strictly according to the manufacturer's specifications. An accurate accounting of all these materials purchased and used on the site shall be maintained, including kinds and quantities of material.	
4.2-B Quarry expansion and use will alter the runoff regime to Forsythe Creek.	PS	4.2-B.1 The bio-retention basin will be designed to minimize erosion at the point of outlet. To meet this standard, the following actions will be taken: 1. The flow from the basin must be attenuated via an increase in basin size and/or decrease in pipe outlet sizing to match post-construction runoff volume to pre-construction runoff volume for the smallest storms up to the 85th percentile storm event (or the smallest storm	LTS

TABLE 2-2 - IMPACT AND MITIGATION SUMMARY
(Continued)

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		event that generates runoff, whichever is larger). 2. A slotted pipe dissipater shall be designed to capture and disperse outflow from the basin to the hillslopes below. The design will be provided by the applicant engineer and is subject to review and approval by RWQCB per the NPDES discharge requirements. 3. Visual observations shall be made at the bio-retention basin outlet after each rain event. Photos from two photo points (one upslope and one downslope of the pipe outlet) shall be taken before (October-November) and after (March-April) the rainy season of each year of quarry operation. Photos shall be available for review by RWQCB and will be submitted with the Construction and Industrial General Permits' annual reporting.	
4.2-C	The project could adversely affect groundwater resources.	LTS	No mitigation is required.	LTS
4.2-D	*Cumulative impact* - The project in combination with other projects would generate sediments and other pollutants that could potentially violate water quality standards and/or impact habitat.	PS	The mitigation measures recommended for Impact 4.2-A apply to this impact.	LTCC
4.2-E	*Cumulative impact* - Future mining of the quarry could generate sediments and other pollutants that could potentially violate water quality standards and/or impact habitat.	PS	The mitigation measures recommended for Impact 4.2-A apply to this impact.	LTCC
4.2-F	*Cumulative Impact* - Future expansion of the quarry will alter the runoff regime to Forsythe Creek.	LTCC	No mitigation is required.	LTCC
4.2-G	*Cumulative Impact* - Future expansion of the quarry could adversely affect groundwater resources.	LTCC	No mitigation is required.	LTCC
4.3	**Biological Resources**			
4.3-A	Project development could impact special status plant species, either directly or through habitat modification.	PS	4.3-A.1 Project construction or operation shall not adversely affect special status species of plants. If feasible, surveys for special status species of plants will be conducted by a qualified biologist approved by the County prior to certification of the Final EIR or project approval. Otherwise, surveys will be conducted prior to project-related vegetation removal. New surveys shall be conducted every three years in areas that have not yet been mined. If special status species of plants are found, the plant will be avoided, or, if that is not feasible, the biologist will confer with	LTS

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		the Department of Fish and Game to identify suitable mitigation. The applicant will abide by the decision of the Department of Fish and Game concerning the special status species.	
4.3-B	Project development could impact special status wildlife species, either directly or through habitat modification.	PS	All mitigations required for 4.1-E and 4.2-A are required for this impact. 4.3-B.1 As required by law, the project applicant shall not remove nests or den sites of any special status species of wildlife when constructing the project or expanding the quarry. Because special status species may move into the project area in the following years, additional biological surveys will be conducted at least every 3 years to ensure that special status species are not present in the area where vegetation will be removed. The surveys shall be conducted by a qualified biologist, during the spring, in the specific area proposed for vegetation removal. If dens or nest sites of special status species of wildlife are found, the den or nest site will be avoided, or, if that is not feasible, the biologist will confer with the Department of Fish and Game to identify suitable mitigation. The applicant will abide by the decision of the Department of Fish and Game concerning the special status species.	LTS
4.3-C	Project development would result in the loss of about 24 acres of native vegetation.	PS	4.3-C.1 The Final Reclamation Plan shall be submitted to the State Office of Mine Reclamation for review. All conditions recommended by OMR during that review shall become part of the final Reclamation Plan for the project.	LTS
4.3-D	Project development could impact wetlands and "waters of the U.S."	PS	4.3-D.1 The applicant shall conduct all improvements set forth on EIR Figures 3-11 through 3-13. The applicant shall prepare a final improvement plan describing how and when these improvements will be done and monitored and the responsibility for follow-up work if monitoring finds that the improvements are failing or not operating as planned. This plan shall be submitted to the Army Corps and DFG when applying for required permits/agreements. 4.3-D.2 When constructing the on-site haul road, no construction shall occur within the wetland between the haul road and Black Bart Drive. Drainage improvements will be incorporated to allow the area above the road that currently drains to the small on-site wetland to continue to do so. Level spreaders or other structures shall be installed below the road to spread runoff before it enters the wetland.	LTS
4.3-E	Project development could conflict with the State law regarding oak woodland conversion (Public Resources Code	PS	4.3-E.1 During site preparation for the access road to the asphalt processing facility, the access road to the water tank, and the	LTS

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
	21083.4).		asphalt processing facility itself, the applicant shall flag the actual area to be graded or disturbed. A qualified biologist shall inventory the species and number of true oaks that will actually be removed or encroached in such a fashion that could lead to future mortality. Similar inventories shall be done when trees are removed for quarry expansion. 4.3-E.2 Plant replacement oaks on the applicant's property (Assessor's Parcel Nos. 147-180-07, & -08 and/or 147-140-07) within three years of project approval or tree removal, whichever is later. The new oaks will be replanted at a ratio of 3:1 for each oak removed. New seedlings will be the same species as the tree removed except that canyon live oak will be used instead of interior live oak. If black oak in the area become infected with SOD, then a non-susceptible species of oak will be used to replace black oak. The oaks shall be fertilized, irrigated, protected, and maintained until they are 5 years old. Any trees dying within that period shall be replanted until there are new live trees at the 3:1 ratio described above on the property that have been alive for at least 7 years. Tree seedlings should be planted no closer than 10 feet apart from other tree seedlings and no closer than 20 feet apart from the trunk of any mature tree. Compacted ground shall be broken to an area three times the diameter of the root ball prior to planting to allow root growth. Trees shall be watered weekly by the property owner in weeks with no natural precipitation (usually April 15 through October 15 of each year) and shall be watered three times per week when temperatures exceed 100 F° for the first three years after planting. During site reclamation, additional oaks will be planted at a 2:1 ratio. So, at least 5 new oaks will be established for each one removed by the end of site reclamation.	
4.3-F	Project development would convert Timberland to other uses.	LTS	No mitigation beyond complying with existing laws and regulations is needed.	LTS
4.3-G	Removal of trees from the site could spread Sudden Oak Death to other areas.	LTS	No mitigation beyond complying with existing laws and regulations is needed.	LTS
4.3-H	Project development could interfere with wildlife movement or impede the use of nursery sites.	LTS	No mitigation beyond complying with existing laws and regulations is needed.	LTS
4.3-I	*Cumulative Impact* - The project in combination with possible future mining of the site could adversely affect biological resources.	LTCC	No mitigation is required.	LTCC

TABLE 2-2 - IMPACT AND MITIGATION SUMMARY
(Continued)

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
4.3-J	*Cumulative Impact* - The project, a possible future expanded quarry, and other development in the area could adversely affect biological resources.	LTCC	No mitigation is required.	LTCC
4.3-K	*Secondary Impact* - Widening Highway 101 per Mitigation Measure 4.4-B.1 will impact biological resources.	PS	Mitigation Measures 4.3-E.1 and 4.3-E.2 also apply to this impact. 4.3-K.1 The applicant shall implement the proposed expansion and improvements of the vernal pool as shown on Figure 3-14. Final improvement plans will be approved by the Army Corps and the Department of Fish and Game, and the applicant shall be responsible for implementing any changes or additions the Corps and/or Department make to the improvement plan. It is expected that the Corps or the Department of Fish and Game will require a functional or qualitative assessment of the vernal pool that will be expanded to ensure that it is considered a "higher resource" than the two small roadside wetlands that would be filled. At least the following additional conditions will apply: • To ensure success of the vernal pool expansion, a water budget for the given drainage area shall be developed to ensure the site can support a larger pool feature. If it cannot, then runoff from other nearby slopes shall be directed to the vernal pool. • Prior to construction, baseline data shall be gathered at the vernal pool mitigation site, over multiple hydrologically different years (three years minimum), to determine characteristics such as the size, depth, duration of inundation, slope, and biologic species present before construction. This will ensure existing wetlands are not damaged and provide a reference for the performance of the new wetlands. After construction, monitoring shall occur every year for at least 7 years or until specific performance standards are met. • Pool expansion shall mimic existing habitat characteristics. Construction plans shall be adjusted based on baseline data collection. • Maintain the hydrology of the pool after construction by preparing horizontal and vertical relief plans for the contractor-operator. The plan should mimic the existing pool	LTS

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		as much as possible as regards the depth, no berm, and the back slope, and ensuring the soil type is continuous. A final plan shall describe all details and operation of the pool. • Written protocols shall be developed for each stage of construction. Protocols shall cover the collection of baseline data, post construction hydroperiod, and the establishment of vegetation and wildlife. • Inoculation materials shall be raked from the existing vegetation during the end of the dry season and then spread over the raked constructed pool during the beginning of the wet season. • A conservation easement shall be established to ensure the vernal pool is protected.	
4.4	**Traffic and Circulation**		
4.4-A	The project would increase traffic volumes at the intersections of Highway 101 with Black Bart Drive and the quarry access.	LTS	No mitigation is required.	LTS
4.4-B	The project would increase traffic turning in and out of the project access, and this would increase the existing safety hazard in the area.	PS	4.4-B.1 The applicant shall construct the following improvements prior to increasing aggregate production or selling asphalt: • Highway 101 Northbound Approach – Provide a left-turn deceleration/storage lane on Highway 101 at least 470 feet in length. • Highway 101/Southbound Approach – Provide a right-turn deceleration lane on Highway 101 at least 400 feet in length. • Highway 101 Northbound Departure – Provide a speed change acceleration lane for left turns from the project site extending at least 1,410 feet in length (which would extend through and north of the Black Bart Drive intersection) as well as a 300-foot taper (total length 1,710 feet). • Highway 101 Southbound Departure – Provide a speed change/acceleration lane for right turns extending at least 1,090 feet from the project site as well as a 300-foot taper (total length of 1,390 feet). Although only a 300-foot-long acceleration taper is theoretically warranted, observations of	LTS

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		truck driver turns and their disruption to the flow of traffic on southbound Highway 101 indicate the need for the full acceleration lane with Base volumes. • A lighted sign with a flashing beacon (with a solar panel) that warns southbound Highway 101 travelers of slow and turning trucks shall be placed on the west side of Highway 101 about 925 feet north of the project access driveway. A similar sign and beacon that warns northbound Highway 101 travelers shall be placed on the east side of Highway 101 south of the project access driveway, at a distance that meets Caltrans' requirements. 4.4-B.2 Project-generated traffic shall not result in unsafe operational conditions near the project site as determined by the Mendocino County Department of Transportation and Caltrans. To ensure conformance with this performance standard, the following shall be done: • Traffic operational and accident conditions shall be monitored at the Highway 101/Harris Quarry Access and Highway 101/Black Bart Drive intersections every two years after project approval. Counts and evaluation shall be conducted during both July and October. The applicant shall fund each study, and the County shall select the firm to conduct the monitoring. Filming of traffic counts and truck driver behavior will be done to provide a defensible record of actual operations. • If a monitoring report indicates a safety or operational problem at either intersection, an evaluation will be conducted of potential additional mitigation measures that should be considered for implementation. Measures may include: 1) limits on how many trucks can be loaded during peak hours; 2) limits on trucks making left turns in and/or out of the access driveway during peak hours; and 3) provision of a partial or full interchange at the Harris Quarry Access intersection and the possible connection of Black Bart Drive to that new interchange in conjunction with elimination of the Highway 101/Black Bart Drive intersection. If the County and Caltrans agree that such operational changes and/or highway improvements are	

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		warranted, then they shall be installed within three years. The applicant shall be responsible for paying its fair share (as determined by Caltrans and the County) of the improvements. • Sufficient right-of-way shall be maintained at the Highway 101/Harris Quarry Access intersection to provide a partial or full interchange, if ever required. 4.4-B.3 Aggregate production and project-generated traffic shall not exceed the levels predicted and assessed in this EIR. Every three (3) years, an aerial survey of the site shall be submitted to the Department of Planning and Building Services to evaluate the volume of material extracted during the 3-year period. The survey shall include topographic mapping developed from aerial photos taken in such a manner as to clearly show the full extent of the extraction area. The aerial survey aerial shall delineate the limits of extraction for the previous 3 years. A report shall be prepared by a licensed engineer or land surveyor or photogrammetrist, and shall quantify the extraction volume based on the aerial survey. Photos and topographic mapping shall include a standard reference scale and north arrow, and shall be of size and quality acceptable to the Department of Planning and Building Services. A baseline aerial photo and topographic map shall be taken and submitted to the Department of Planning and Building Services within 90 days of approval of this permit."	
4.4-C	Nighttime use of the project access would increase the safety hazard in the area.	PS	4.4-C.1 During nighttime operations that will occur more than 5 days a year, the applicant will provide lighting that illuminates the access intersection. The lighting can be permanent lighting or temporary lighting such as Caltrans uses in construction zones.	LTS
4.4-D	Use of the project access during times with limited visibility would increase the safety hazard in the area.	PS	4.4-D.1 The southfacing side of the "truck warning sign" located north of Black Bart Drive shall be painted or treated with a reflective surface or have a light installed that can be seen from the project access driveway. During periods of reduced visibility, the quarry operator will monitor the visibility of this sign. When it is not visible from the project access driveway, then trucks will not be permitted to turn left out of the project. Drivers will need to turn right and proceed to the Highway 101/Highway 20 interchange where they can turn and proceed north. Once the Willits Bypass is constructed, northbound drivers wanting to turn left into the project who cannot see the reflective surface of the warning sign	LTS

TABLE 2-2 - IMPACT AND MITIGATION SUMMARY
(Continued)

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		will be required to proceed north to the first Bypass interchange where they can turn and access the project from the north. The applicant shall prepare a driver's training manual for trucks that haul aggregate or asphalt. It shall notify drivers of the requirements described above. 4.4-D.2 The monitoring done by the County-approved monitor recommended in Mitigation Measure 4.4-B.2 shall include monitoring of safety and compliance with Mitigation 4.4-D.1 during periods of limited visibility.	
4.4-E	*Cumulative Impact* - The project would increase 2014 traffic volumes at the intersections of Highway 101 with Black Bart Drive and the quarry access.	PS	Mitigation Measures 4.4-B.1, 4.4-B.2, 4.4-C.1 and 4.4-D.1 are required for both 2014 scenarios.	LTCC
4.4-F	*Cumulative Impact* - The project would increase 2030 traffic volumes at the intersections of Highway 101 with Black Bart Drive and the quarry access.	PS	Mitigation Measures 4.4-B.1, 4.4-B.2, 4.4-C.1 and 4.4-D.1 are required for both 2030 scenarios.	LTCC
4.5	**Noise**			
4.5-A	The project would generate noise that might affect residents living in the area.	LTS	No mitigation is required.	LTS
4.5-B	The project would generate noise and vibration from quarry blasting.	PS	4.5-B.1 Blasting shall be done as needed, but no more than ten times per year.	LTS
4.5-C	Project-generated traffic noise could increase ambient traffic noise levels along roadways serving the project site.	LTS	No mitigation is required.	LTS
4.5-D	Existing noise-sensitive land uses could be exposed to construction noise levels in excess of the significance thresholds.	LTS	No mitigation is required.	LTS
4.5-E	*Cumulative Impact* - The project plus cumulative increases in traffic could adversely affect residents living along Highway 101.	LTS	No mitigation is required	LTS
4.6	**Air Quality**			
4.6-A	Project construction would increase air emissions from equipment operation and fugitive dust from earth-moving activities.	PS	4.6-A.1 Implement the measures recommended by MCAQMD under their Rule 430 for Fugitive Dust Emissions as listed below: 1. All visibly dry disturbed soil road surfaces shall be watered to minimize fugitive dust emissions. 2. All unpaved surfaces, unless otherwise treated with suitable chemicals or oils, shall have a posted speed limit of 10 miles per hour**.** 3. Earth or other material that has been transported by	LTS

TABLE 2-2 - IMPACT AND MITIGATION SUMMARY
(Continued)

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		trucking or earth moving equipment, erosion by water, or other means onto paved streets shall be promptly removed. 4. Asphalt, oil, water or suitable chemicals shall be applied on materials stockpiles, and other surfaces that can give rise to 5. All earthmoving activities shall cease when sustained winds exceed 15 miles per hour. 6. The operator shall take reasonable precautions to prevent the entry of unauthorized vehicles onto the site during non-work hours. 7. The operator shall keep a daily log of activities to control fugitive dust.	
4.6-B The quarry project would generate direct emissions of criteria pollutant emissions (NOx, CO, VOCs, PM10, and PM2.5) from on-site activities during operation of the quarry and asphalt plant which could exceed applicable significance levels.	PS	4.6-B.1 The applicant shall not emit criteria pollutants beyond the levels described and analyzed in this EIR. The Mendocino County Air Quality Management District (MCAQMD) shall not issue an Authority to Construct and a Permit to Operate if the equipment installed would cause the emission of pollutants that exceed the levels analyzed herein. If the MCAQMD determines that the final list of equipment and/or the proposed hours of operation per day and per year of any of the equipment would exceed the levels assessed in this EIR, then additional CEQA analysis would be required to assess the air quality and health impacts of that final list of equipment and operating hours prior to considering whether to issue the Authority to Construct and a Permit to Operate. 4.6-B.2 MCAQMD will review the final list of equipment and the analysis in this EIR and add any additional equipment or operation mitigations that the District finds are needed to avoid air quality standard exceedances and conform to all District, State, and Federal air quality standards and requirements.	LTS
4.6-C The quarry project would generate indirect emissions of criteria pollutant emissions (NOx, CO, VOCs, PM10, and PM2.5) from on-site activities during operation of the quarry and asphalt plant which could exceed applicable significance levels.	PS	No mitigation is available.	SU
4.6-D The project-generated on-road traffic could result in the occurrence of carbon monoxide (CO) hot spots that would exceed the California 1-hour and 8-hour CO standards.	LTS	No mitigation is required.	LTS
4.6-E Emissions of toxic air contaminants from the project could injure the health of workers and residents living in the area.	PS	4.6-E.1 The applicant shall build and operate the project so that it does not exceed MCAQMD threshold indices for cancer and acute and chronic non-cancer health effects. The applicant shall comply with all MCAQMD requirements all facilities, including	LTS

TABLE 2-2 - IMPACT AND MITIGATION SUMMARY
(Continued)

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		for the asphalt facility at least: 1) venting the asphalt storage silos to a Blue Smoke system, and 2) controlling load-out emissions by use of a fiberbed mist collector (part of the Blue Smoke System), unless MCAQMD determines such measures are not required or alternate control measures should be used. 4.6-E.2 The asphalt plant will be a facility that meets at least the emission levels and controls used to assess impacts from that facility in this EIR. If MCAQMD determines that the facility selected for installation would exceed pollutant emission standards as stated in Mitigation Measure 4.6-B.1, then additional risk analysis will be conducted as part of the required additional CEQA review prior to MCAQMD issuing any permits for the project.	
4.6-F	The asphalt plant would generate odors.	PS	4.6-F.1 The asphalt plant shall not result in noxious odors. The plant will be a facility that meets at least the odor emission levels and controls used to assess impacts from that facility in this EIR. If MCAQMD determines that the facility selected for installation would exceed pollutant emission standards as stated in Mitigation Measures 4.6-C.1 and 4.6-E.2, then additional odor analysis will be conducted as part of the required additional CEQA review prior to MCAQMD issuing any permits for the project.	LTS
4.6-G	The quarry project would reduce the elevation of the hill on the site and cause changes to local weather patterns.	LTS	No mitigation is required.	LTS
4.6-H	*Cumulative Impact* - The proposed project could result in greenhouse emissions, either directly or indirectly, that may have a significant impact on the environment.	LTS	No mitigation is required.	LTS
4.6-I	*Cumulative Impact* - The proposed project could conflict with applicable GHG plans, policies, or regulations of an agency adopted for the purpose of reducing greenhouse gases.	PS	4.6-I.1 The applicant shall reduce greenhouse gas emissions from the project by conducting at least the following actions: • Comply with California Air Resource Board standards for light duty and heavy duty vehicles. All vehicles will need to continue to abide by these standards, including possibly stricter standards set in the future. • Restrict idling of diesel engines on the site to less than 5 minutes. • When replacing diesel mobile equipment, purchase new equipment meeting the most recent CARB emission requirements. • Maintain facility mobile equipment in good working order.	LTS

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		• Reclaim the site. • Use energy efficient appliances and lighting. All new equipment shall be energy efficient. Except where needed for outdoor work or security, all new lighting shall use fluorescent lighting. • Increase new building efficiency by 20% over Title 24 standards. • Meet Green Building Code standards for new building construction. • If available, use clean alternative fuels. • Use electricity provided by PG&E to the maximum extent possible to replace electricity generated by the on-site generator. • Install solar panels to power the electrical demands of the office and outdoor lighting. • Install any additional features recommended by the MCAQMD. • Have an energy audit conducted by a qualified individual or firm to identify additional methods to conserve energy (this may include installation of solar panels or other on-site electrical generation facilities). The audit shall be done prior to construction and will confirm that all new equipment and appliances meet accepted standards for energy efficiency.	
4.6-J	*Cumulative Impact* - Additional project-related truck traffic on U.S. 101 would increase regional emissions of criteria pollutants.	LTCC	No mitigation is required.	LTCC
4.7	**Aesthetics**			
4.7-A	The processing facilities site would change views from Black Bart Drive and Ridgewood Subdivision.	PS	4.7-A.1 The asphalt processing facility site shall be planted to screen views from Back Bart Drive. Once the asphalt processing site grading is completed, the applicant shall contract with an arborist to develop a final tree planting plan along the frontage of the site. Plantings will start as the applicant has proposed about 500 feet west of the existing driveway and extend to a point opposite the northeast corner of the facility site. The arborist will determine whether the trees the applicant has available are suitable for the site, or, if not what species of trees shall be planted along this frontage to provide rapid screening of the site from the road. The planting should incorporate fast-growing trees that can quickly provide screening. If feasible, native trees and shrubs should be used. Preferably native oaks and Douglas fir will be incorporated in the planting scheme (which would count against the previous	SU

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		requirement for tree replacement), with oaks being planted behind the faster-growing screening plants or intermixed with them so that at the reclamation phase any non-native species can be removed to leave oak woodland. The plan will detail site preparation, planting, fertilization, irrigation, and performance monitoring as well as replacement standards.	
4.7-B	The quarry expansion would change views from vantage points on the Ridgewood Ranch.	PS	No mitigation is available.	SU
4.7-C	Lighting of the processing facilities would impact night views in the area.	PS	4.7-C.1 Final design and construction shall include no lighting of the asphalt processing facility site except when there are active nighttime operations occurring and for security lighting. The lights will be shielded (90 degree cut-off shielding) lights at no greater than 10 feet in height. Operational lighting will be on light poles distributed to have forward-throw lighting and light trespass cut-off shields. No direct lighting shall be visible from off the site. Lights will be selected from the list of approved security lights adopted by the International Dark Sky Association (IDA). No pinkish, yellowish, or bluish colored light sources will be used. The minimum number of security lights needed for security purposes as determined by the Mendocino County Sheriff's Department will be installed.	SU
4.7-D	The project could adversely affect views from Federal Wilderness Areas.	LTS	No mitigation is required.	LTS
4.7-E	*Cumulative Impact* - The quarry expansion and highway improvements would change views from Highway 101.	PS	4.7-E.1 The area west of Highway 101 between the highway and the newly constructed access road shall be replanted to screen views of the quarry from Highway 101. The tree planting plan required in Mitigation 4.7-A.1 shall include a plan for replanting the area between the project access driveway intersection with Highway 101 and the south end of the quarry site along the highway frontage. This area shall be planted with fast-growing trees that can quickly provide screening to twenty feet above the highway elevation. These trees shall be fertilized, irrigated and maintained by the applicant. 4.7-E.2 The sign at the quarry entrance off the highway shall be kept small and unobtrusive; it shall not exceed 40 square feet.	SU

TABLE 2-2 - IMPACT AND MITIGATION SUMMARY
(Continued)

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
4.8	**Public Services**		
4.8-A	The project would generate increased calls for fire response and emergency medical aid.	PS	4.8-A.1 The applicant shall comply with all Little Lake Fire Protection District (LLFPD) requirements, including: • A sign that complies with LLFPD signage requirements shall be installed at the project entrance. • Liquid on-site storage tanks (other than water tanks) shall be reviewed and approved by LLFPD. If multiple tanks are placed in close proximity to one another, the spacing between tanks must be reviewed and approved by LLFPD. • LLFPD shall review and approve the final project design to ensure adequate hydrant location and fireflow to the hydrants. • LLFPD will approve the size, type, and number of fire extinguishers for the project. Approved spark arrestors must be installed on all internal combustion engines that require them. These items are required during and after construction. • The water storage tank will be fit with the apparatus that LLFPD and/or CAL FIRE require to be able to access the water in the tank. 4.8-A.2 An emergency-only, gated, and paved access shall be provided from the asphalt processing facility site to Black Bart Drive.	LTS
4.8-B	The project would increase the risk of igniting wildland fires or being affected by a wildland fire.	PS	The mitigation measures recommended for Impact 4.8-A also apply to this impact.	LTS/B
4.8-C	The project would generate increased calls for police services.	LTS	*No mitigation is required.*	LTS
4.8-D	The project would generate increased demand for water.	PS	4.8-D.1 The quarry shall cease operations if the applicant cannot provide 7,200 gallons of water per day for dust control. The amount of required water for dust control may be reduced by the Mendocino County Air Quality Management District if it determines that the applicant, using alternative methods of dust control, is preventing dust from drifting off the property.	LTS
4.8-E	If not properly designed and constructed, the new on-site wastewater system could adversely impact water quality.	LTS	No mitigation is required other than complying with existing County regulations.	LTS

TABLE 2-2 - IMPACT AND MITIGATION SUMMARY
(Continued)

	IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
4.9	**Hazards and Hazardous Materials**			
4.9-A	Transport, storage, and use of explosives pose the risk of an unplanned explosion.	LTS	No mitigation is required other than complying with existing State laws and regulations.	LTS
4.9-B	Transport, storage, and use of diesel fuels and other chemicals on-site pose a potential safety risk.	PS	All mitigations required for Impacts 4.1-B, 4.1-C, 4.4-B, 4.4-D, and 4.8-A also apply to this impact. In addition, the following mitigation is required: 4.9-B.1 Trucks transporting diesel fuel will be restricted to turning left into the site no later than 10 a.m. If deliveries occur after 10 a.m., the delivery truck must access the site from the north.	LTS
4.10	**Land Use**			
4.10-A	Project construction and operation could adversely affect agricultural operations in the project area.	LTS	No mitigation is required	LTS
4.10-B	Project construction and operation could result in land use conflicts with Ridgewood Ranch.	NA	No mitigation is required, as the specific impacts and mitigations are addressed under other impacts.	NA
4.10-C	Development and operation of the asphalt processing facility would cause land use conflicts with residential uses to the west and north.	NA	No mitigation is required, as the specific impacts and mitigations are addressed under other impacts.	NA
4.10-D	*Cumulative Impact* - Development and operation of processing facilities at other quarries in the County that would be allowed by the proposed Mineral Processing Combining District could have significant environmental impacts.	Speculative	No mitigation is required.	Spec-ulative
4.11	**Energy Use**			
4.11-A	Construction of the proposed project would use electricity, gas, and diesel fuel, but this energy demand would not result in the need for new or altered facilities or exceed the capacity of PG&E.	LTS	No mitigation is required	LTS
4.11-B	Future operation of the project would require relatively substantial use of energy, but this energy demand would not result in the need for new or altered facilities or exceed the capacity of PG&E's ability to provide service.	LTS	No mitigation is required	LTS
4.12	**Cultural Resources**			
4.12-A	Future development of the site could damage cultural resources.	PS	4.12-A.1 If cultural resources are discovered on the site during construction activities, all earthmoving activity in the area of impact shall be halted until the applicant retains the services of a qualified archaeological consultant who shall examine the findings, assess their significance, and develop proposals for any procedures	LTS

IMPACTS	SIGNIFICANCE BEFORE MITIGATION	MITIGATION	SIGNIFICANCE AFTER MITIGATION
		deemed appropriate to further investigate and/or mitigate adverse impacts to those resources. The applicant shall abide by the recommended proposals. 4.12-A.2 In the event that human skeletal remains are discovered, work shall be discontinued in the area of the discovery and the County Coroner shall be contacted. If skeletal remains are found to be prehistoric Native American remains, the Coroner shall call the Native American Heritage Commission within 24 hours. The Commission will identify the person(s) it believes to be the "Most Likely Descendant" of the deceased Native American. The Most Likely Descendant would be responsible for recommending the disposition and treatment of the remains. The Most Likely Descendant may make recommendations to the landowner or the person responsible for the excavation/grading work for means of treating or disposing of the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98. 4.12-A.3 If any paleontological resources are discovered, 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 can then be made regarding the finds, and a management plan consistent with CEQA cultural resources management requirements shall be adopted.	

Chapter 3.0

Project Description

3.0 PROJECT LOCATION AND DESCRIPTION CHAPTER

3.1 Project Locale and Setting

As shown on Figures 3-1 through 3-3, the Harris Quarry is located immediately west of U.S. Route 101 ("Highway 101") near the top of the Ridgewood Grade (at mile marker 40.77); the proposed asphalt processing facility site is northwest of the quarry. The property is owned by Northern Aggregates, Inc. and Erica Peters. The property includes about 320 acres and includes Assessor's Parcel Nos. 147-180-08 & --13 and 147-140-07. These 320 acres are part of a larger approximately 600-acre holding that is owned by Northern Aggregates, Inc. or one or more of that company's owners. The site is designated Rangeland in the Mendocino County General Plan and is zoned Rangeland (RL160 – 160 acres is the minimum new parcel size). Approximately 30.6 acres will be mined, and an additional 9.2 acres will be developed for access and for processing. This will result in an additional 28.3 acres of new disturbance and 11.5 acres of existing disturbance, totaling 39.8 acres of disturbance for the project. An additional 5.1 acres will be disturbed in order to provide mitigation that is proposed to offset project impacts.

Harris Quarry is an existing quarry that has been intermittently mined since the 1920s (although the County officially first permitted mining of the quarry on June 2, 1983).[3] The site was once part of the larger Charles S. Howard property. The Church of the Golden Rule sold the 600 acres that includes the Harris Quarry in the 1970s through 1980s. The property was logged in the 1950s and again in 2006 by the current owners.[4] Northern Aggregates, Inc. (NAI) currently extracts aggregate from the 11.5-acre quarry. Elevations at the quarry range from about 1,850 feet (existing quarry floor) to 2,275 at the top of the ridge in the proposed expansion area.

The site of the proposed asphalt plant is located immediately south of Black Bart Drive (County Road No. 370) about 2,000 feet west of the intersection of Black Bart Drive with Highway 101 and about 600 feet from the northwest corner of the proposed quarry. The site is vegetated by plants of four plant communities: the tanoak, chamise, canyon live oak shrub, and grassland series. The area north of the existing quarry is wooded, while chamise and other chaparral dominate the area west of the existing quarry.

Surrounding land uses include lands that are all zoned Rangeland except for an area adjacent to Highway 101 immediately north of Black Bart Drive. The following outlines adjacent land uses:

- To the east of the quarry site is Highway 101. East of the highway is the Northwest Pacific Railroad line and west and southwest-facing hillsides vegetated with mixed hardwood forest, chaparral and grassland. This area is open space.

- To the west of the quarry is undeveloped land (approximately 600 acres) owned by the applicant. Further west and southwest, there is rural residential development.

[3] The quarry does not have a "vested right" since no permits were issued until 1983.

[4] The logging was conducted pursuant to an approved Timber Harvest Plan (THP MEN-278), which was approved on September 29, 2000 with a Final Completion and Stocking Inspection (which found no violations of the Permit) on January 10, 2006.

The nearest residence to the quarry is about 1.4 miles to the west. The nearest residence to the asphalt processing facility site is about one mile to the west.

- To the south is undeveloped open space on the Ridgewood Ranch owned by the Church of the Golden Rule. The Church's compound (off Ridgewood Road) is located about one mile south of the quarry. A mobile home park (Golden Rule Mobile Village) is located about 1.75 miles south of the quarry.

- To the north of the quarry site and northeast of the asphalt processing facility site is some roadside commercial development along Highway 101, including 5-6 residential units, several former commercial outlets (service station, restaurant, and motel) and a mobile home sales facility. Further north of this area are the California Highway Patrol truck scales. This area is zoned Commercial (C2). This development is as near as 1,000 feet of the asphalt processing site. Across the highway is CAL FIRE's Howard Forest fire station, which is about 3,000 feet northeast of the asphalt processing facility. North of the asphalt processing facility site (and west of the highway commercial area) is open space land owned by the applicant. Further north and northwest are rural residential properties; the property boundary of the nearest rural residential property is about 3,000 feet north of the asphalt processing facility site, with the nearest home (other than the 5-6 units described above) located approximately one mile away.

3.2 Project Description[5]

A. Approvals Sought

The applicant, Northern Aggregates, Inc., requests the County of Mendocino approve the following:

1. Amending the Mendocino County Zoning Code to create a Mineral Processing Combining District (MPCD).

2. Adding an MPCD to a portion of project parcel Assessor's Parcel No. 147-140-07.

3. Rezoning 18 acres of Assessor's Parcel No. 147-140-07 to add a new Mineral Processing Combining District that would allow processing of aggregate for the length of the Use Permit (see Figure 3-17). The applicant has volunteered to include a condition of approval requiring the applicant to submit an application to revert the 18 acres back to Rangeland zoning at the end of the Use Permit.

[5] The applicant has submitted an amended application for the project dated January 12, 2009. In some places this application incorporates data included in earlier submittals dated December 2003, June 2004, and July 2006. These applications have been further modified by the applicant prior to the completion of this Draft EIR. The project description presented in this EIR is defined as "the project description." In case of any discrepancies between this description and any earlier submittals, the description listed in this EIR takes precedent.

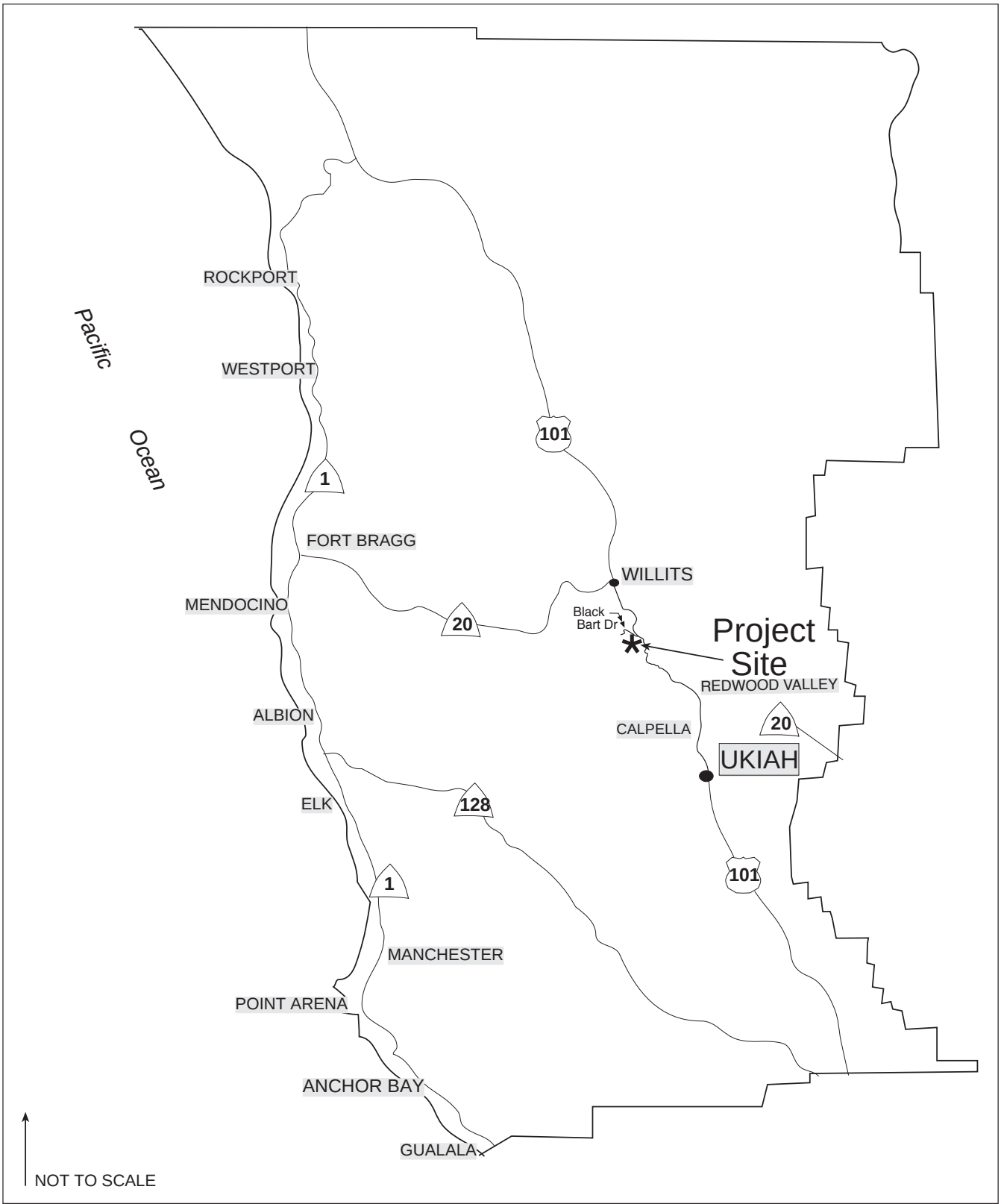


Figure 3-1: REGIONAL LOCATION

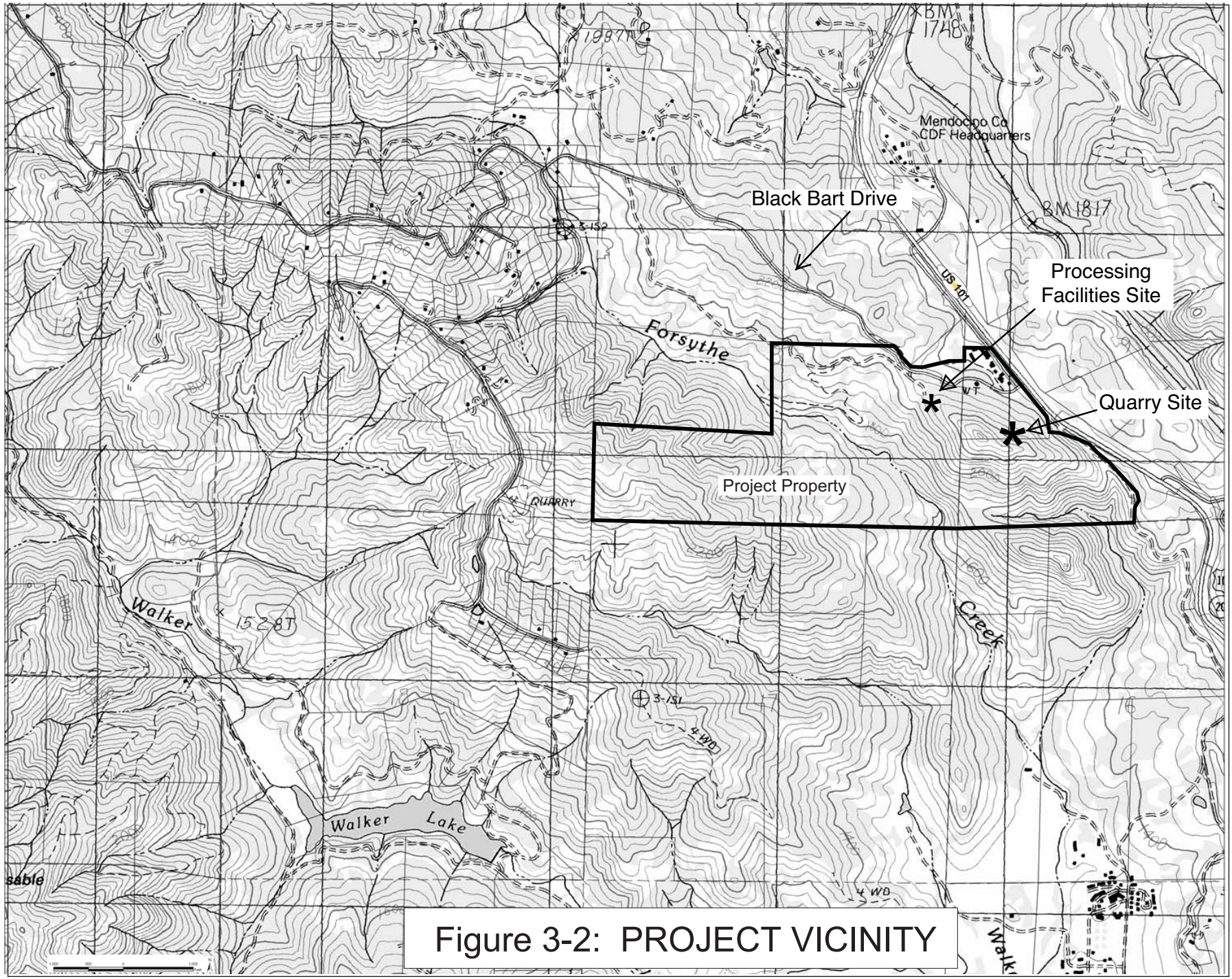


Figure 3-2: PROJECT VICINITY

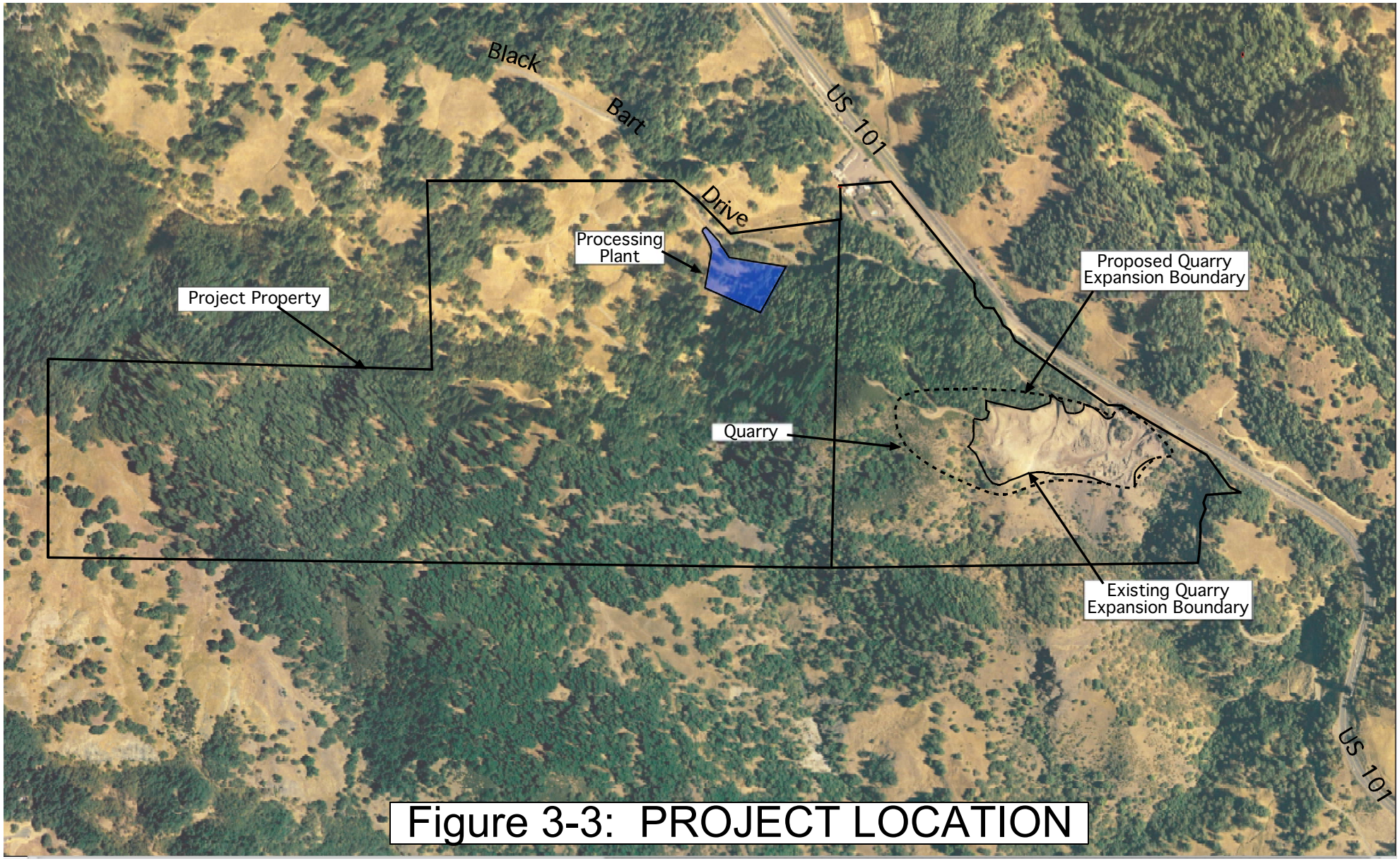


Figure 3-3: PROJECT LOCATION

4. Use Permit Renewal/Modification (UR 19-83/2005) to allow:

    - extraction and processing of 200,000 cubic yards (CY) *in situ* per year for a 30-year period,

    - production of up to 150,000 tons (58,280 CY) of asphalt per year; and

    - nighttime operations up to a maximum of 100 nights per year.

5. A revised Reclamation Plan that directs how the site will be reclaimed at the end of the use permit.

B. Introduction to the Scope of Project

Northern Aggregates, Inc. (NAI or "the applicant") is requesting County approval of a Use Permit Renewal/Modification and Reclamation Plan Modification (UR 19-83/2005) to allow extraction of rock from an existing hillside quarry and to construct an asphalt processing facility. The applicant is also seeking to have a Mineral Process overlay added to the Rangeland base zoning, which would result in a new designation for the parcel as Rangeland with a Mineral Processing Combining District (RL:MP). This overlay, or combining district is new, and the applicant is requesting that it be adopted by the County and added to the existing zoning code.

Current Use Permit #UR 19-83/95 applies to the existing quarry, which has been in use since the mid-1920s. In 1990, the permit modification #UM 19-83/90 allowed for a one-time extraction increase and a one-time increased processing limit of 125,000 cubic yards of rock, but this modification expired in 1995. The permit provides for an annual 75,000 *in situ* (i.e., the volume of rock as measured in place in the quarry wall or floor) cubic yard extraction rate, which is the current annual production rate.

The applicant is requesting an annual permitted extraction volume of 200,000 cubic yards *in situ* per year for a 30-year term; this extraction maximum will stay the same throughout the quarry's permitted term. The applicant is not proposing any mining activities beyond the 30 years requested in the Use Permit Application

The following information presented in Section 3.2 is based on the project description data, including supporting technical reports, that were provided by the applicant. The EIR consultants and County staff have reviewed and commented on the applicant's submittals to ensure that the description presented below addresses the important components of the project. However, the description and claims presented below are solely the applicant's. The EIR will assess accuracy of these claims when identifying and assessing the potential impacts of this proposed project description, including an assessment of the accuracy of supporting technical data.

C. Project Objectives

These objectives have been provided by the project applicant.

The objectives of this application are to: 1) secure a permit that will allow for the continued operation of the Harris Quarry mine for 30 years; 2) expand the maximum allowable annual extraction from the quarry to 200,000 cubic yards (in situ) per year; and 3) add a new asphalt facility to the site. The quarry operation is necessary to continue and expand its yearly volumes in order to accommodate the added demand for aggregates from the existing and proposed processing facilities, and to compensate for the decreased aggregate availability within the County. This decreased supply is the result of several local quarries' closures due to exhaustion of their reserves or permit expirations. Aggregates are also necessary to maintain the existing road infrastructure, and demand increases as population growth expands in the future. The added demand and decreased supply has resulted in added truck miles traveled hauling aggregate and aggregate products from other sources, both in and out of Mendocino County.

The fourth objective is to locate the asphalt processing facility close to the aggregate source and the market demand is an important part of this application. This location provides many added benefits, from both the environmental and economic perspectives. Some of these are reduced truck traffic on our highways, and County or City roads, and thus reduction in diesel emissions and infrastructure wear and tear. This is evidenced in the amended traffic study which analyzed the pre- and post- project conditions for vehicle miles traveled in transporting aggregate. The most significant traffic reduction will result from the elimination of hauling aggregate from out of County sources, such as Lake County, the Central Valley or Sonoma County. The proposed access design will utilize the Highway 101 entrance as the ingress and egress and improve the safety of current traffic lane movements by adding turning deceleration and acceleration lanes. There will be no routine truck traffic on Black Bart Drive as a result of the proposed project. The proposed Highway Improvements are proposed as mitigation and are not part of the project.

Economically the County will benefit from added tax revenues from materials sold, since many of the materials used in the County are currently imported. Also the addition of a second asphalt plant in the Ukiah area will allow for greater competition and choice to all of the local contractors and government agencies. In the past every asphalt facility in Mendocino was originally located next to an aggregate source, which was then rezoned to a Heavy Industry (I2) designation. It is important to keep the asphalt plant in close proximity to the aggregate source to provide a cost savings that is then forwarded on to the consumer, as is discussed above. The asphalt facility will also possess the capacity to use Recycled Asphalt Pavement (RAP) which currently is not possible in this County. This helps reuse old pavement while reducing the amount of new oil and aggregates required for asphalt, which is also an added environmental benefit from the project.

The fifth objective is to locate the project between Willits and Ukiah, the main aggregate consumption areas. Additionally, the location has a large buffer of property around the site that shields most of the operations from the surrounding residences. The majority of this land is owned by the applicant.

The quarry is unique to the area in that the rock extracted from the site is of a very high density and durability. This is important since concrete and asphalt grade aggregates are not always available from every rock source. Another advantage to this site is the relatively low amount of overburden that must be removed prior to mining. This aids in not having to use additional land for stockpiling and reduces trucking and equipment use as well.

Overall this project will result in a consolidated and streamlined operation of new technology equipment that will help to provide needed materials for this County's sustainability.

The applicant has withdrawn their original request for an "End of Life" permit, and has limited the requested permit to 30 years. It should also be noted that the Surface Mining and Reclamation Act (SMARA) requires that Lead Agencies, in this case the County of Mendocino, help to identify and conserve areas of known mineral deposits, and to help reduce encroachment of incompatible land uses.

The applicant has volunteered to accept a Condition of Approval requiring the applicant to submit an application to have the MP Combining District removed from the project site through a rezone back to Rangeland only at the end of the 30-year Use Permit.

D. Existing Operations

Mining begins with clearing, grubbing, and stripping and stockpiling of topsoil. This occurs incrementally as required to extend the active mining face of the quarry. Rock at the quarry is loosened by blasting. This blasting is done about three times a year by a professional blasting company. The loosened rock is removed from the quarry face by a dozer and loaders and transported to a primary (jaw) crusher that delivers the crushed material to two secondary (cone) crushers and through three screens. Crushed material is conveyed by 13 conveyors to the screens and secondary crushers and ultimately to the appropriate material stockpiles.

Average daily quarry production is about 700-800 cubic yards (CY) with maximum daily production of about 1,200 CY. During normal years the quarry operation averages about 90-100 days per year. Current annual permitted production is 75,000 CY with a one-time allowable extraction of 125,000 CY. County records indicate that actual quarry extraction, averaged between 1996 and 2010, was approximately 75,000 CY.

Haul trucks enter the site and are loaded with the appropriate material. Currently, the site does not contain a wash facility for aggregate, but is permitted to do so under an existing permit. The effects of installing and using this facility will be assessed in this EIR. NAI hauls aggregate that is used for concrete and asphalt to a wash facility owned by the applicant located at 351 Franklin Avenue in Willits. This facility is currently permitted by the City of Willits. This facility also handles recycled asphalt and concrete. Recycled materials are crushed on that site with a portable crusher and stockpiled for future use.

The applicant (also operating under the name Nor Cal Recycled Rock and Aggregates, Inc.) currently operates a concrete processing facility at 291A Shell Lane in Willits, which operates under Use Permit # U-93-2 issued by the City of Willits.

Existing Harris Quarry aggregate processing equipment includes:

Electrical

- One jaw crusher – 150 HP (i.e., horsepower)
- Two cone crushers – 250 & 400 HP
- Three screens - 40 HP each
- 13 conveyors - 250 HP total
- One belt press – 12 HP
- 4 pumps – 90 HP total
- One Feeder – 25 HP
- One Stacker – 50 HP
- One Wash Plant – 50 HP total (in place, but non-operational)

Gas/Diesel

- Three 980 wheeled loaders – two in operation, one for spare use, of which one is Tier 1[6]
- One Cat 345 excavator, Tier 3
- One D11R bulldozer, Tier 1
- One Cat 226B Skidsteer, Tier 2
- One Cat 3512C generator, 2,012 HP with a W/PM filter, Tier 2
- One Cat MQ-25 generator, 36 HP
- One Isuzu Generator, 17-25 HP generator[7]

Currently, the applicant operates one bottom dump truck for about 160 days per year to haul aggregate between the quarry and the concrete plant in Willits. During higher volume days, up to 3 bottom dump trucks may be used.

E. Description of Quarry Expansion

The proposed quarry project is shown on Figures 3-4 and 3-5.

1. Proposed Quarry Expansion

Over the life of the project, the applicant proposes to expand the quarry from about 11.5 acres to 30.6 acres (a proposed expansion of about 19.1 acres). The applicant estimates that the proposed mining area contains about 6,000,000 cubic yards (CY) of aggregate, and that it would take 30 years to remove this amount of material. The overall mine reserve to remain in place (not included in this application) is estimated to be at least an additional 12,270,000 CY.

[6] "Tier" refers to what level of emission controls have been installed. The higher the tier, the greater the control requirements, so Tier 3 has more requirements and installed controls than a Tier 1. All equipment where no Tier number has been assigned are Tier 0.

[7] Until PG&E power is extended to the site, the applicant will continue to use a 22 HP generator to operate the scale shack and a portable generator to operate the well.

NOTES

1. DELETED
2. EQUIPMENT STORAGE AND PRODUCT STORAGE SHALL BE KEPT OUTSIDE PATHS OF CONCENTRATED (STORM WATER) FLOWS. LOCATION AND SIZE OF STOCKPILES ARE APPROXIMATE ONLY. PLACEMENT MAY BE LOCATED ANYWHERE ON QUARRY FLOOR EXCEPT AS RESTRICTED HEREIN.
3. FUELING SHALL TAKE PLACE AS FAR FROM SEDIMENTATION & INFILTRATION PONDS AS POSSIBLE.
4. FINAL SWPPP TO BE PROVIDED BY RAU.
5. REFER TO EROSION CONTROL DETAILS AND NOTES HEREIN.
6. EQUIPMENT ACCESS ROADS CONSTRUCTED OUTSIDE OF THE QUARRY DRAINAGE BOUNDARY SHALL BE CONSTRUCTED WITH 1.5:1 FILL SLOPES AND 1.25:1 CUT SLOPES.
7. FIBER ROLLS SHALL BE PLACED ON CUTS/FILLS EXCEEDING 10' HEIGHT AND BE PLACED AT MID-SLOPE OR 10' SPACING, WHICHEVER IS LESS.
8. LOCATION AND SIZE OF RETENTION POND WILL VARY. SIZE OF POND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE RETENTION POND ANALYSIS PREPARED BY RAU AND ASSOCIATES. SIZE OF POND SHALL BE VERIFIED AS ADEQUATE BY A CIVIL ENGINEER EVERY 5 YEARS UNTIL FULL POND CAPACITY.

BLACK BART DR.
COUNTY RD. No. 370-GRAPHIC LOCATION OF R-O-W SHOWN

MATCH LINE THIS SHEET

(E) WATER TANK

(E) WATER TANK

PROCESSING SITE SEE PROCESSING SITE PLANS FOR DETAILS

ALTERNATE TOPSOIL STOCKPILE LOCATION (6 D-5)

STOCKPILE

EXISTING CELL TOWER TO REMAIN

SEE NOTE 6 FOR CUT/FILL SLOPES OUTSIDE OF QUARRY DRAINAGE BOUNDARY

DAYLIGHT (LIMIT OF DISTURBANCE) LIMIT OF MINING

(2 D-5) CONSTRUCT 12' WIDE INTERNAL HEAVY EQUIPMENT ROAD

ARROWS INDICATE WATERSHED DIRECTION (TYPICAL)

PROPOSED SEPTIC LEACH FIELD AREA

CONSTRUCT 24' WIDE AC HAUL ROAD SEE PROCESSING SITE PLANS FOR DETAILS

WELL (E)

LIMITS OF EXCAVATION (TYP)

RECONSTRUCT AND REALIGN EXISTING APPROACH ONTO HIGHWAY 101 AND CONSTRUCT HIGHWAY CHANNELIZATION IMPROVEMENTS. SEE PROCESSING SITE PLANS AND HIGHWAY CHANNELIZATION PLANS APPROACH LAYOUT. FINAL DESIGN TO BE CONSTRUCTED PER ENCROACHMENT PERMIT STANDARDS.

APPROX. 1900 SF POTENTIAL WETLANDS AND 2,035 SF EXISTING CALTRANS DITCH TO BE REMOVED WITH FILL CONSTRUCTION-SEE PLANS M-1 THROUGH M-4 FOR REPLACEMENT MITIGATION.

PROPOSED QUARRY FLOOR ELEV. = 1830-1850±

MOVE FEEDER AND EXTEND CONVEYOR BELTS WITH FACE OF QUARRY AS NECESSARY

CONSTRUCT 12' WIDE INTERNAL HEAVY EQUIPMENT ROAD (2 D-6)

SEE DETAILS ON SHEET Q-6 FOR ADDITIONAL GRADING INFORMATION

SEDIMENTATION AND INFILTRATION POND (4 D-7) TOP OF POND: 1827.0 BOT. OF POND: 1815.0

PRODUCT STOCKPILE LOCATION @ QUARRY FLOOR. SEE NOTE 2 (6 D-7)

ALTERNATE TOPSOIL STOCKPILE LOCATION @ QUARRY FLOOR (6 D-7)

STOCKPILE

PRODUCT STOCKPILE

MODIFY EXISTING SEDIMENT POND

SEE INSET BELOW FOR POND MODIFICATIONS

INSTALL SILT FENCE PER (3 D-7)

TAILINGS ARE TO REMAIN WITHIN MINE BOUNDARY-PROTECT SLOPE AND THALWEG FROM FUTURE SPILLS NOTCH (OR CONSTRUCT) 3' HIGH BERM (TYP) MIN. ELEVATION=1853. PER (5 D-7) SEE NOTES HEREON

(E.) CONTOUR LINE = 1850 LIMITS OF MINING

50' OFFSET TO THALWEG

(E) THALWEG

SEC B- SEE SHEET Q-6

SEC A- SEE SHEET Q-6

RECONSTRUCT 24' WIDE AC HAUL ROAD FROM STA 84+00 TO 107+00 SEE HIGHWAY IMPROVEMENT PLANS AND PROCESSING SITE PLANS FOR DETAILS

(E) 1,000 GAL. FUEL TANK

(3 D-5) RESURFACE EXISTING SERVICE ROAD. STA 108+00 TO SCALES

(E) 30' ACCESS OPENING

(E) PRODUCT SCALES

(E) RESTROOM

(E) 3' (MIN.) HIGH BERM AROUND EXISTING SUMP TO REMAIN

CREATE ROCKED OVERFLOW WEIR ELEVATION 1845±

(E.) 5,000 GAL. WATER TANK

LOCATION OF QUARRY HAUL ROAD (1 D-5)

(E) 10,000 GAL FUEL TANK

(E) PROCESSING EQUIPMENT TO REMAIN

(E) WASHPLANT

MAINTAIN (E) BERM

DITCH AT 2-5% TO EXISTING AND NEW RETENTION BASIN

PROPOSED PRODUCT STOCKPILE

PROPOSED 10,000 GAL. TANK FOR MAKE-UP WATER

PROPOSED 20,000 GALLON CLARIFIER TANK

PROPOSED QUARRY LIMIT-TYP

POTENTIAL VERNAL POOL EXACT LOCATION NOT CONFIRMED

INSTALL CHANNEL ARMORING AT JUNCTION OF CHANNELS FOR MITIGATION CREDIT TOWARDS CHANNEL LOSS. IMPROVEMENTS TO BE COMPLETED PER CDFG PERMIT.

ROUTE 101 VARIABLE WIDTH RIGHT-OF-WAY

CONSTRUCT NORTHBOUND ACCELERATION LANE

(E) TREES ON PERIMETER TO REMAIN

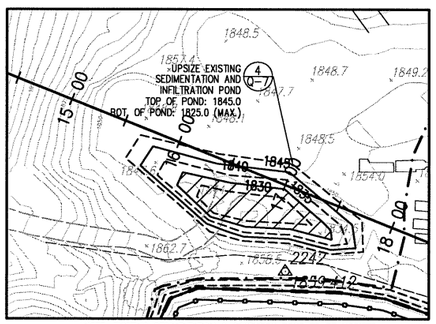
EXISTING STATE HIGHWAY ROW SEE HIGHWAY IMPROVEMENT PLANS SHT PC-1

MATCH LINE THIS SHEET

SEE SHEET Q-6

0 120 240
SCALE: 1"=120'

REGISTERED PROFESSIONAL ENGINEER
GEORGE C. RAU
C 21908
Exp. 09-30-2011
11.30.2010
CIVIL
STATE OF CALIFORNIA



NOTE: EXISTING SEDIMENTATION & RETENTION POND TO BE MODIFED AS QUARRY FLOOR IS EXPANDED (PRIOR TO 2010). SEE NOTE 8.

INITIAL POND MODIFICATIONS

INSET SCALE: 1"=60'

DATE:	REVISION:	BY:
NOV. '10	REVISED QUARRY HAUL ROAD, TANK ACCESS ROAD	CAM
AUG. '10	REVISED QUARRY HAUL ROAD, ADD WASH AND MOVE MU TANK	CAM
JAN. '10	REVISED QUARRY FOR SINGLE PHASE, 6,000,000 CY @ 30 YR	CAM
SEPT. '06	CLIENT COMMENT (REVISED HAUL ROAD & CHANNELIZATION)	CAM
NOV. '04	INITIAL SUBMITTAL	MDP

DATUM INFORMATION:
VERTICAL DATA: NVGD 1929
HORIZONTAL DATA: SEE SHEET Q-1

BOUNDARY REFERENCE: RECORD OF SURVEY PREPARED BY THOMAS HERMAN, AUG. 1991, FILED IN CASE 2, DRAWER 54, PAGE 47. MENDOCINO COUNTRY RECORDER'S OFFICE

TOPOGRAPHICAL SURVEY REFERENCE: TOPOGRAPHICAL INFORMATION IS BASED ON AN AERIAL SURVEY PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES (JUNE 2004); THIS MAP WAS PREPARED USING COMPUTER ASSISTED, PHOTOGRAMMETRIC METHODS PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES) PHOTOGRAMMETRY IN AREAS OF DENSE VEGETATION MAY BE COMPROMISED AND ACCURACY OF CONTOURS MAY DEVIATE FROM ACCEPTED ACCURACY STANDARDS.

CLIENT & OPERATOR: NORTHERN AGGREGATES, INC.

PROJECT LOCATION: (EXISTING) HARRIS QUARRY OPERATION @ RIDGEWOOD GRADE
APN: 147-180-008
MENDOCINO COUNTY, CALIFORNIA

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET · (707) 462-6536 · UKIAH, CA 95482

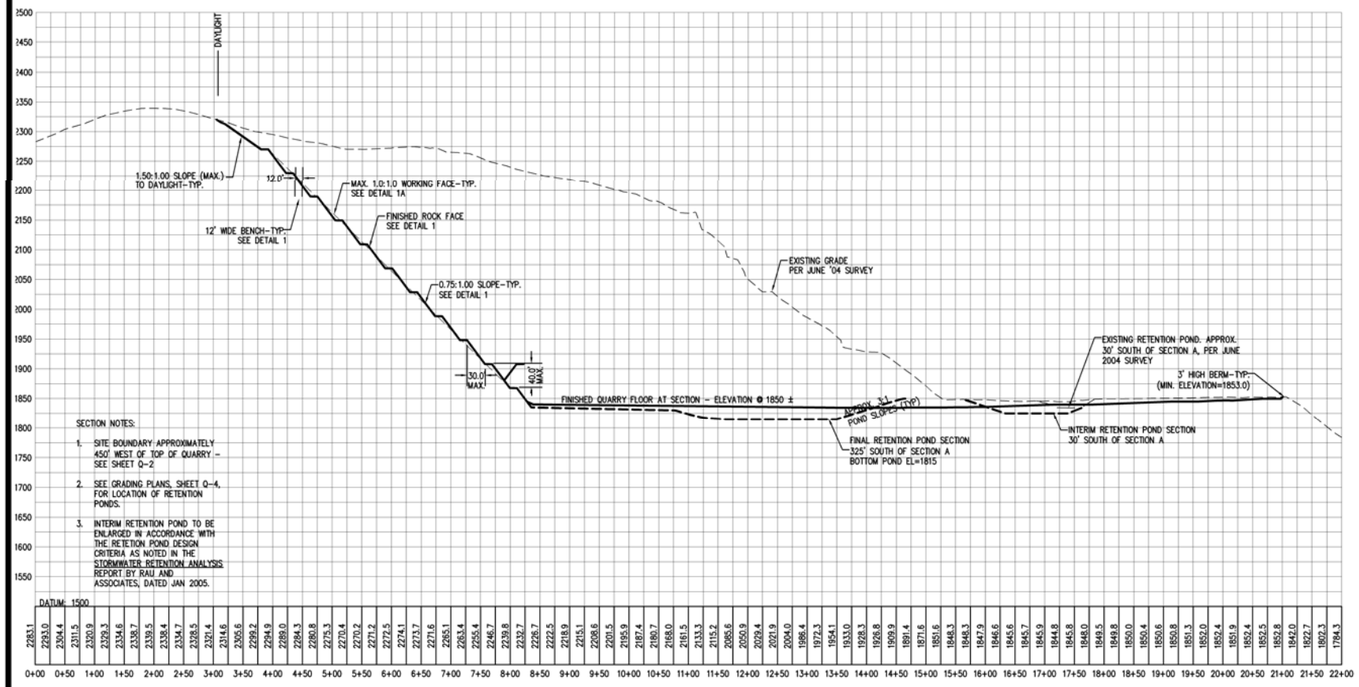
DRAWING: GRADING & EROSION CONTROL PLAN FINISHED FLOOR ELEVATION @ 1850

Date: DECEMBER 2004
Scale: 1"=120'
Design/Drawn: MDP
Checked: MDP/CAM
Reviewed: GCR
JOB NO. R04056

Figure 3-4

VERSION: FOR COUNTY REVIEW ONLY; RECIRCULATED EIR

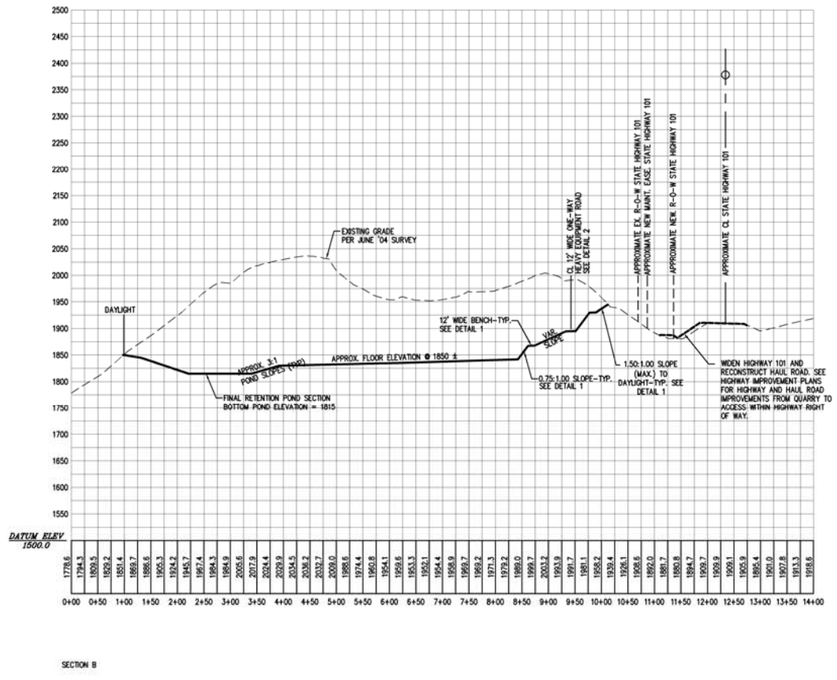
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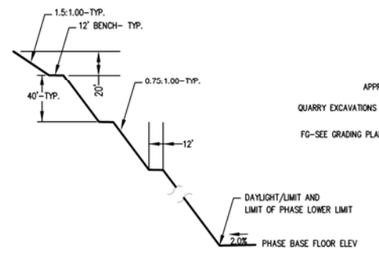
SECTION NOTES:

1. SITE BOUNDARY APPROXIMATELY 450' WEST OF TOP OF QUARRY – SEE SHEET Q-2
2. SEE GRADING PLANS, SHEET Q-4, FOR LOCATION OF RETENTION PONDS.
3. INTERIM RETENTION POND TO BE ENLARGED IN ACCORDANCE WITH THE RETETION POND DESIGN CRITERIA AS NOTED IN THE STORMWATER RETENTION ANALYSIS REPORT BY RAU AND ASSOCIATES, DATED JAN 2005.

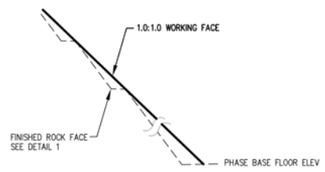
SECTION A– H.=V.: 1"=120'



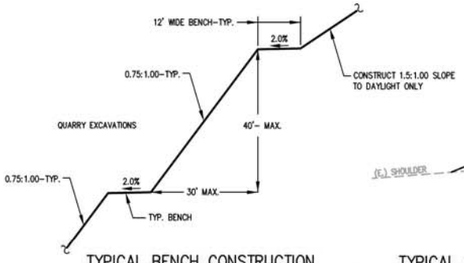
SECTION B– H.=V.: 1"=120'



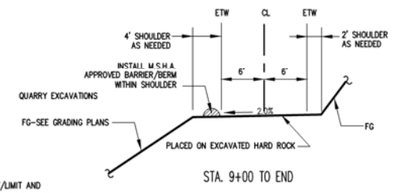
SECTION FOR FINISHED FACE OF ROCK
DETAIL 1– NTS



SECTION FOR WORKING FACE OF ROCK
DETAIL 1A– NTS

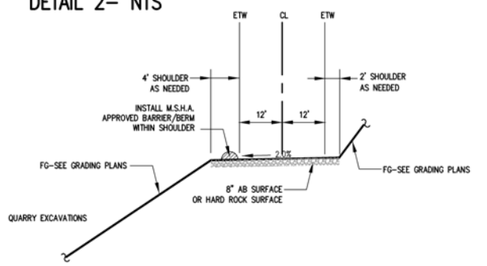


TYPICAL BENCH CONSTRUCTION
DETAIL 4– NTS

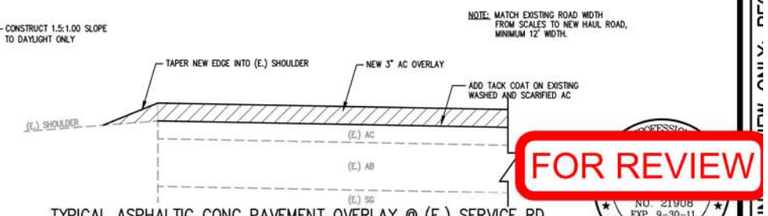


STA. 9+00 TO END

TYPICAL 12' WIDE HEAVY EQUIPMENT ROAD (WITHIN QUARRY)
DETAIL 2– NTS



TYPICAL 24' WIDE TWO-WAY HAUL ROADWAY DETAIL (WITHIN QUARRY)
DETAIL 3– NTS



TYPICAL ASPHALTIC CONC PAVEMENT OVERLAY @ (E.) SERVICE RD.
DETAIL 5– NTS

NOTES:

1. FOR 24' WIDE PAVED MAIN HAUL ROAD IMPROVEMENTS FROM STATION 83+75 TO 108+00 SEE PROCESSING SITE PLANS.
2. BERMS NOT REQUIRED ON QUARRY FLOOR.

FOR REVIEW

NO. 21908 EXP. 9-30-11 CIVIL STATE OF CALIFORNIA

DATE:	REVISION:	BY:
JAN. '10	REVISED QUARRY FOR SINGLE PHASE, 6,000,000 CY. @ 30 YR	CAM
SEPT. '06	CLIENT COMMENT (REVISED HAUL ROAD & CHANNELIZATION)	CAM
NOV. '04	INITIAL SUBMITTAL	MDP

DATUM INFORMATION:
VERTICAL DATA: NVGD 1929
HORIZONTAL DATA: SEE SHEET Q-1

BOUNDARY REFERENCE: RECORD OF SURVEY PREPARED BY THOMAS HERMAN, AUG. 1991, FILED IN CASE 2, DRAWER 54, PAGE 47. MENDOCINO COUNTRY RECORDER'S OFFICE

TOPOGRAPHICAL SURVEY REFERENCE: TOPOGRAPHICAL INFORMATION IS BASED ON AN AERIAL SURVEY PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES (JUNE 2004). THIS MAP WAS PREPARED USING COMPUTER ASSISTED, PHOTOGRAMMETRIC METHODS PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES) PHOTOGRAMMETRY IN AREAS OF DENSE VEGETATION MAY BE COMPROMISED AND ACCURACY OF CONTOURS MAY DEVIATE FROM ACCEPTED ACCURACY STANDARDS.

CLIENT & OPERATOR: NORTHERN AGGREGATES, INC.

PROJECT LOCATION: (EXISTING) HARRIS QUARRY OPERATION @ RIDGEWOOD GRADE
APN: 147-180-008
MENDOCINO COUNTY, CALIFORNIA

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET · (707) 462-6536 · UKIAH, CA 95482

DRAWING: SITE SECTIONS & DETAILS

Date:	DECEMBER 2004
Scale:	1"=120'
Design/Drawn:	MDP
Checked:	MDP/CAM
Reviewed:	GCR
JOB NO.	R04056

Figure 3-5

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As shown in Figure 3-4, the quarry expansion would occur in a single phase. The mining would expand to the north and west while maintaining the current elevation of the quarry floor (approximately elevation 1,850 feet). Mining includes initial blasting of the rock and then removal with a dozer and loader. The quarry face would be benched with 12-foot wide benches (to allow vehicle access and slope stability); there would be 40-foot vertical cuts (typically cut at a slope of 0.75:1, or 0.75 horizontal extensions for every 1 foot of vertical drop) between the benches. The final mining will result in a crescent floor area with a depression for stormwater retention. See Figure 3-5 which shows the sections through the quarry site. Final grading near the northern portion of the ridgeline (called "the upper slope" within an area of weaker rock) will result in 1.5:1 slopes.

The limits of proposed mining are shown on Figure 3-4. The southern limit of the quarry will not extend any closer than about 200 feet from the middle of the unnamed tributary of Forsythe Creek that lies south (downhill) of the quarry. A 100-foot high elevation offset (resulting in at least a 200-foot horizontal setback) will be maintained between the south edge of the quarry and the thalweg of that tributary (i.e., midpoint of the drainage). The west limit of the quarry mining will maintain a 300-foot offset to the western parcel boundary. The east mining boundary will be defined by the proposed access road leading from the quarry to the asphalt processing facility. On the north, approximately 300 feet of undeveloped land lies between the north quarry mining boundary and the constructed access road. The access road grading has been roughly graded under an existing grading permit. The undeveloped land will be retained between the quarry operations and Black Bart Drive as a buffer.

The existing Use Permit allows excavation of the quarry face to an elevation of 2,190 feet. The proposed expansion would allow the peak of the quarry face to be at 2,325 feet. Geotechnical analyses of the quarry expansion have been conducted; they recommend certain measures to ensure quarry stability and safety.[8] Although a Slope Stability analysis has already been completed for the final grade and benching, at the request of OMR, the applicant proposes to have a professional geotechnical engineer review the site excavation once it is within 150 feet of the finished quarry limits.

As the working face of the quarry moves northwest, new conveyors will be added to transport the material from the face of the quarry to the existing processing facilities location. It is estimated that one new conveyor will be needed every 10 years. Access roads for haul trucks will remain in the same general location as they currently are, and they will be paved. The floor of the quarry will be used primarily for equipment use, not truck hauling, and is expected to be rock/gravel surfacing as it currently is.

Reclamation activities will begin as soon as is practical for the applicable portion of the project in conformance with the recently revised Reclamation Plan prepared by RAU and Associates in January 2011. At the conclusion of the 30-year use permit, the applicant will submit an application to rezone the asphalt processing site back to Rangeland, and the applicant anticipates that the site will be demobilized. All equipment and structures

[8] *Engineering Geology and Geohazards Report, Harris Quarry, Willits, California,* Blackburn Consulting, Inc., December 2004, and *Slope Stability Analysis, Harris Quarry Final Face*, Blackburn Consulting, Inc., October 2008. These reports are on file with the Mendocino County Department of Planning and Building Services.

will be removed. All the nine remaining exposed areas will be reclaimed (see Reclamation section below).

The project applicant does not anticipate that there will be an increase in the amount of equipment currently used for quarrying, except for the conveyors as noted above. However, as existing equipment wears out, it will be replaced by newer equipment.

The applicant proposes to extract 200,000 *in situ* CY (approximately 248,000 CY processed), of aggregate per year and import 10,000 CY of recycled material from other sources. This will make up the maximum total quantity of aggregate extracted and processed each year. The aggregates needed for off-site concrete production and on-site asphalt production will utilize some portion of this amount and will not be in addition to this amount.

When a "fluff" factor is applied (I.e., after rock is crushed, it takes up more space than it does in place on the hillside) to the 200,000 CY of *in situ* rock and added with the recycled aggregate, approximately 258,000 CY of raw processed aggregate are estimated to be available for sale or to be incorporated into concrete or asphalt products.[9] Of this aggregate volume, it is estimated that 37,200 CY of processed aggregate will be used for concrete aggregate and hauled to the Willits concrete plant, and that 58,280 CY of aggregate will be used for making asphalt concrete aggregate. This will leave approximately 162,520 CY of raw processed aggregate for sale. The material production volumes anticipated by the project are summarized in Table 3-1 below.

Table 3-1[10]
Proposed Project Volumes and Distribution

SOURCE	Annual Production	Percent of Annual in: July	October
MATERIAL PROCESSED			
Material Mined	200,000 cy	n/a	n/a
Increased Material Volume by Bulking	48,000 cy	n/a	n/a
Recycle Material Imported	10,000 cy	9.4%	12.2%
TOTAL MATERIAL PROCESSED	***258,000 cy***		
MATERIAL DISTRIBUTED			
Aggregate Production For Sale	162,520 cy	9.4%	12.2%
Aggregate transferred to Willits for PCC	37,200 cy	10.0%	15.8%
AC Production	58,280 cy	12.0%	17.0%
TOTAL MATERIAL DISTRIBUTED	***258,000 CY***		

2. Material Recycling

The applicant will recycle concrete and asphalt at the quarry. Materials imported for recycling would be stockpiled at the quarry and crushed, then likely moved to the

[9] Processing the solid rock breaks it into pieces so that it takes up more space due to the introduction of air and water voids than when located in situ – this expansion in space is referred to as the "fluffing factor." The fluffing factor for Harris Quarry rock is estimated to be 1.24.

[10] Table supplied by project applicant and presented in "Errata for Updated Supplemental Traffic Impact Analysis for Harris Quarry", dated April 14, 2010, formerly Entitled Table 6, "Trip Generation Assumption with Proposed Project".

process area if it is recycled asphalt or crushed concrete for slurry, while the envirobase (an alternative base rock type material that is made up completely of used asphalt or concrete, and is a therefore a 100% recycled material) would be sold out of the quarry. It is estimated that 10,000 CY per year would be processed requiring two to six truck trips per day on average.

3. Wash Operations

The only new addition to the quarry plant equipment would be an aggregate wash plant. This plant is currently on the site, but it is non-operational. An amendment to the existing use permit to allow this wash plant was previously approved by the County of Mendocino. The wash plant uses a closed-loop washing system. The primary components of this closed loop system are the coarse material washer, sand cyclone, thickener tank, belt press, dewatering screen and flocculent system. The wash plant is used to remove dirt from the aggregate so that it is suitable for asphalt and concrete production. 95% of the water used in this washing process will be recycled. The remainder of the water either evaporates or remains in the washed material. Wash water is pumped to the thickener tank, the water then recirculated after the solids have settled. The belt press is then used to extract the water from the fine material. A flocculent (an additive) is introduced into the existing dirty water to help rapidly settle out the suspended fines. The use of a flocculent reduces the amount of water surge and basin space that is needed for sufficiently washing aggregates. The fine material will be dried and either sold on its own, as washed fill material, or blended back into other products. The fines are clay like material that are washed off of the rock and primarily composed of minus #150 mesh gradations. Washed rock typically produces less than 0.5% wash loss, and sand is typically 7%. The applicant estimates they will wash approximately 104,000 tons of aggregate annually, with 68,000 tons being sand and the remainder rock.

4. Hours of Operation

The hours of quarry operation are currently 7 a.m. to 4 p.m.; the concrete plant in Willits operates from 5 a.m. until 4 p.m. Hours of operation are fairly consistent through the day for aggregates. There is adequate storage of aggregate at the Willits concrete plant site for the early shift at the concrete plant, and no aggregate hauling from the quarry to the Willits plant prior to 6:00 AM is needed. The quarry can open at any time day or night any day of the week when there are emergency situations, typically per the request of Caltrans or the County Department of Transportation. These emergency situations may happen between 0 to 5 times per year.

Proposed hours for the quarry are:

- Quarry operations: 6 a.m. - 5 p.m., Monday through Saturday
- Equipment running: 7 a.m. - 5 p.m., Monday through Saturday

These are the proposed hours during the busiest time periods; on average the hours and volumes will be far less than what is being proposed. Currently, the aggregate crushing operation does not operate 5 days per week, every week of the summer. A more continuous operation will allow for the additional requested volume without putting excess demand (or additional equipment) on the operations. The quarry will typically

only operate from Monday to Friday, 5 days a week., though processing and loading for specific projects could occur on weekends. On Saturdays, the yard would not be open to the general public for product sale, but would be limited to appointment only. The operations times indicate when plant personnel may be present. The equipment running time indicates when 90% or more of the actual equipment operating and processing occurs. As a worst case scenario, these operations could occur up to 10 hours within a 24-hour period. At the quarry this would occur during daytime hours unless under an emergency work situation. Even under an emergency situation, quarry nighttime operations would consist only of loading out trucks and not the operation of crushing equipment.

The applicant requests that in the event of emergency circumstances, the facility still be allowed to operate nights (beyond the limits described above) and Sundays, when deemed permissible by the County. This currently is the practice, and would occur at most up to 5 times per year. These situations usually occur in the winter months as a result of flood and winter weather conditions.

5. Aggregate Storage

During the regular operating season, minimal aggregate stockpiles will be kept at the quarry site. Since the site is not very large, this is the applicant's preferred method to help keep congestion and areas where trucks and people cannot be seen to a minimum. Storage of clean aggregate materials is proposed at the asphalt processing site to provide visual screening of the asphalt facility. Where practical, these stockpiles will remain on-site and be replenished to continue to provide this visual barrier. Since the quarry does not typically operate during the rainy season, stockpiles are usually built up during this period so that customers are able to be serviced through the winter months, and the applicant is prepared for any emergency work that may occur.

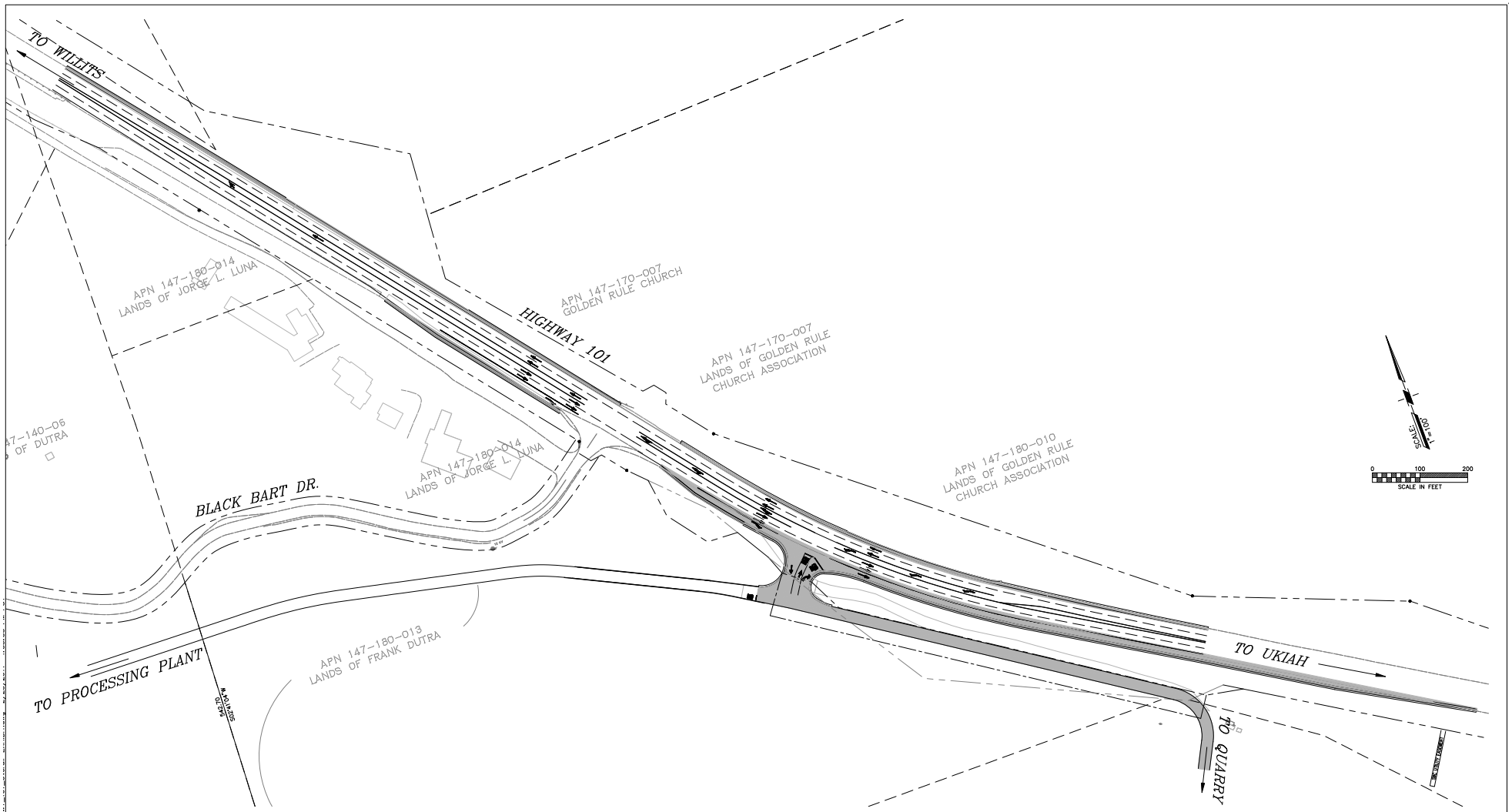
6. Topsoil Management

Currently, the quarry does not have a topsoil storage area. According to the applicant, soils were too thin in the initial mining phases to warrant storage. Topsoil from the proposed expansion will be cleared and stockpiled in dedicated topsoil storage areas as shown on Figure 3-4. The topsoil storage piles will be revegetated to suppress dust.

7. Access and Circulation

a. Project

Currently, access to the quarry is via a driveway that intersects Highway 101 about 500 feet south of Black Bart Drive's intersection with the highway. This driveway is the previous route for Highway 101. The large drainage ditch to the west of the access driveway that services Highway 101 and conveys highway drainage, was constructed as part of the original highway construction (see Figure 3-4). Access to the asphalt processing facility site will be via a two-lane road constructed entirely on the quarry site. Access to all facilities will be directly from Highway 101. As part of the proposed project, the applicant proposes to make all on-site roadway improvements up to the western edge of Highway 101 as shown on Figure 3-4.



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			FILE: HWY_101_Overall-Exhibit.dwg
			PSVIEW: PC01
			MSVP:
			MSVIEW:

VERIFY SCALE
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BAR REPRESENTS THREE INCHES ON ORIGINAL

USE OF THIS DOCUMENT, INCLUDING THE INCORPORATED DESIGNS, IS AN INSTRUMENT OF SERVICE FOR THIS PROJECT AND SHALL NOT BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF RAU AND ASSOCIATES INC.

OWNER: NORTHERN AGGREGATES, INC.
RIDGEWOOD SUMMIT

LOCATION: 16100 N. HIGHWAY 101
WILLITS, CA 95490

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS • LAND SURVEYORS
100 NORTH PINE STREET • (707) 462-6536 • UKIAH, CA 95482

DRAWING: SCHEMATIC OF HIGHWAY IMPROVEMENTS FOR MITIGATION

PROJECT: HARRIS QUARRY OPERATION
HIGHWAY 101 CHANNELIZATION

Date:	FEB. 2011
Scale:	AS SHOWN
Drawn:	M.A.W.
Checked:	C.A.M.
Reviewed:	G.C.R.
Job No.	R04056.1

Figure
3-6

b. Proposed Highway Improvement Mitigations

Based on the original Draft EIR and input during earlier reviews of the project from Caltrans, the County, and the public, the applicant expects to be required to conduct widening of Highway 101 to mitigate for project-caused congestion and safety hazards. This EIR will confirm whether these highway improvements, or some modification of them, are needed to mitigate traffic impacts. The following describes the widening and highway improvements that the applicant suggests would mitigate these impacts.

The highway would be modified and widened on both sides to include a center left-turn deceleration lane into the quarry, a right- and left-turn acceleration lane, and a right-turn deceleration lane. These improvements are shown in detail in the 20 maps and exhibits that comprise the *Highway Improvement Plans, Highway 101 Channelization, Willits, CA, 01-MEN-101-40.51/41.14* (these large-scale design figures are on file for public review at the offices of the Mendocino County Department of Planning and Building Services); Figure 3-6 is a schematic rendering of the proposed mitigation. Basically, the improvements include:

- A right-turn (southbound) acceleration taper will be constructed south of the project access to allow trucks to come up to speed before entering the highway travel lanes. This taper will extended about 1,390 feet south from the project access.

- A right-turn deceleration lane will be constructed about 360 feet north of the project access to allow southbound trucks entering the project access to pull out of the travel lane before entering the project access.

- A northbound left-turn center lane into the project access will be constructed. This lane will provide a refuge and provide northbound trucks a lane to pull into before entering the project access. It will extend about 469 feet south of the project access. With this improvement the majority of the truck deceleration will no longer take place in the fast lane of the highway, which will eliminate the need for a truck to stop in the fast lane while waiting for a gap in the southbound traffic in order to turn into the project.

- A northbound left-turn lane will be constructed north of the project access for outbound traffic. This lane will provide a location where trucks can turn left (north) from the project access without needing to enter the fast lane of the through northbound travel lanes, as is currently the case. This northbound lane will also be the left-turn lane for drivers turning left into Black Bart Drive; the continuation of this lane north of Black Bart Drive will also provide a refuge and acceleration lane for drivers turning left (north) out of Black Bart Drive. The northbound left-turn lane will extend about 1,710 feet north of the project access.

Currently, there is no center lane, and trucks entering and leaving must do so from the high speed lane on the highway. Creation of this center lane should reduce the risk for potential accidents and be a vast improvement to the current intersection configuration. This direct access will also keep the truck traffic off of any County roads, thus isolating the trucks from local residential vehicles and traffic. Traffic entering the site from a southbound direction will have a several hundred foot deceleration pocket to allow them

time to slow for the site and exit the highway. The access pad intersection will be deepened and leveled to accommodate the intersection improvements. From the proposed driveway intersection with Highway 101, trucks will have the option of proceeding south to the quarry to load aggregate or to travel northwest to the asphalt processing facility to load asphalt. The applicant's trucks that transport aggregate to the asphalt processing facility will use the same internal road system for interplant transport without entering the highway.

Truck volumes during normal operating periods will remain similar to the current quarry levels, this being 18 trucks per hour maximum and 5-6 per hour on a normal day. The quarry now supplies rock to the Willits concrete facility and in the past has supplied rock for asphalt production in Mendocino County. Once the asphalt facility is located at the quarry site, these aggregates used for asphalt production will now leave in a finished state instead of as a raw material. Due to the on-site transport of materials, this means that there will not be a large traffic increase during normal operations, only a change in the type of materials that are leaving the site. However, during peak hourly operations the volume of trucks leaving the site will increase, to a maximum of 26 trucks per hour during the peak hour of the peak days of the peak operating month of October. On an average day during October, this volume decreases to 17 trucks per hour during peak hour traffic. Due to the differing hours of operation for these two facilities, the maximum hourly rate could only be achieved between the hours of 8 a.m. and 12 p.m. during the weekdays, and only with a peak production period occurring at both operations concurrently. On average during normal operations, it is anticipated that 8 trucks per hour would leave the site.

8. Drainage and Water Quality

The applicant has submitted a stormwater study for the proposed expansion.[11] The following summarizes that more detailed report, which is on file with the Mendocino County Department of Planning and Building Services.

There is currently no stormwater discharge from the quarry site. The quarry floor is graded towards the face of the quarry, and a small sedimentation and detention pond has been excavated near the southwest edge of the existing quarry face. Runoff from the quarry face and floor drains towards the quarry face and this retention pond. Currently, the quarry does not discharge runoff from the quarry floor. The quarry floor can contain runoff from a 100-year, 24-hour storm event without discharging to slopes or drainage channels off the site. The detention pond is cleared of sediment annually, which is sold as an aggregate product. The floor has sufficient capacity to contain additional runoff. Safe disposal from the floor can only be obtained by allowing the floor to discharge to the existing 30-inch pipe that outlets into the Forsythe Creek tributary. Discharge to this pipe would occur only during a catastrophic event (a storm much larger than the 100-year event).

There are two existing runoff channels along the west and east sides of the driveway/service road, joining just north of the scales at the quarry. From here, runoff is routed via culvert to an existing watercourse south of the quarry. This channel drains the undeveloped hillside to the northeast of the quarry and road runoff from Black Bart

[11] *Stormwater Retention Analysis,* Rau and Associates, Inc., January 2005.

Drive and Highway 101. The only quarry-related operations that drain to this channel are from the existing service road.

The applicant proposes to allow zero discharge from the quarry up to and including a 100-year, 24-hour storm event. Every three years, the applicant will check and, if necessary, modify the sedimentation and detention pond configuration to ensure that it is capable of storing runoff from a 10-year, 24-hour storm event. The pond has been sized to accommodate sediment that accumulates between seasonal cleanings. The quarry floor will be graded towards the central pond at a minimum 2% slope. The location of the initial pond site and final pond site is shown on Figure 3-4. Because there is excess storage available on the quarry floor, an overflow weir is not felt to be necessary. However, to provide a safety net in the event of a catastrophic storm event a rock weir was included in the plans at the sump area west of the scale shack to allow drawdown of accumulated stormwater during that unlikely event.

The applicant has submitted a Notice of Intent to the North Coast Regional Water Quality Control Board (NCRWQCB) for the current facility stating that the facility is in compliance with requirements of the State of California Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) general permit waste discharge requirements associated with industrial activities. The current (September 2004) Storm Water Pollution Prevention Plan is on file with the Mendocino County Planning and Building Services Department. To demonstrate the generally proposed compliance with the requirements of the NPDES for the asphalt processing site, the applicant has prepared a Draft Storm Water Pollution Prevention Plan for the process area that outlines the proposed Best Management Practices (BMPs) for this facility. Since the preparation of this Draft SWPPP, additional calculations have been provided and supplemental BMPs have been incorporated into the design, including shutoff valves and a covered structure over the fueling area. The applicant will submit to NCRWQCB a fully completed Storm Water Pollution Prevention Plan in accordance with the current NPDES regulations in place at the time of permit approval.

The structural BMPs currently implemented on the quarry site include a 2-foot to 6-foot berm along the southerly rim of the site that prevents stormwater runoff leaving the site and the installation of a sediment/detention pond on-site to concentrate stormwater and settle sediment on-site. The existing sediment pond will contain a 2-year, 24-hour storm event, and the existing quarry floor configuration will contain a 100-year, 24-hour storm event. As long as the floor of the quarry can contain all of the quarry runoff, the sizing of the ponds is an operational issue and will only limit the operation of the quarry, not affect the water quality. The applicant has indicated that they are satisfied with the pond sizing (containing a 2-year storm) at present, but will enlarge and relocate the pond once the floor is enlarged and area is available to contain runoff from 10-year, 24-hour storm events to keep the water concentrated in one area for the majority of storms that would be likely to be encountered during the life of the permit. The design of the quarry incorporates a pond to provide adequate detention for both sediment and stormwater as recommended.

During mining the quarry will maintain the existing southerly berm along the perimeter of the site and continue to conduct the operations to control fallout of tailings into the southerly ravine and topsoil stabilization with covering or planting. Other existing BMPs installed on-site include paved access roads into and out of the quarry to prevent mud

from tracking onto public roads and to minimize sediment runoff into the roadside channels; there are two bypass culverts (36-inch culverts under the processing site) to direct upstream runoff away from and minimize contact with the quarrying operation.

9. Lighting

Since the quarry does not operate at night, the only lights that will be installed at the quarry are security lights at the scale house.[12] There will be a light that stays on under the porch roof at the scale house, and then one on a motion sensor that will shine down on the entry road at the scale house. This light will be mounted approximately 15 feet above the ground and pointed downward and shielded to avoid upward glare. For emergency nighttime operations, no additional lighting would be provided.

10. Energy Use

The existing quarry is powered by a 2,012-horsepower, tier 2, generator with a PM filter. The generator is used for approximately 1,200 hours per year; in the summer it is used about 8 hours per day. Two smaller generators are used to operate the scale shack and the well, respectively. These two generators will be removed once PG&E power is supplied. The applicant has submitted a request to PG&E to extend an electrical power line from Black Bart Drive to the quarry site. The applicant has requested a 12KV line, but can utilize an A10 Primary service, which will allow them to use machinery that totals 670 horsepower on the existing 12 KVA line. This would allow the applicant to power the scales, well pump, and some other existing equipment. The existing 2,012-horsepower generator will be used when more energy is required than can be provided by the PG&E grid.

11. Water Demand, Supply and Storage

a. Water Demand

Existing Demand

Under existing conditions, water usage at the quarry is limited to aggregate processing and dust suppression. Washing of aggregate for concrete and asphalt is currently done at a separate facility in Willits. During processing, water is added using sprinklers to increase the moisture content of the aggregate and limit dust produced during crushing and screening. Aggregate processing occurs for about 90 days during the peak operating season (June through October) and 30 days during the off season (November through May). The amount of water needed for processing varies seasonally and is estimated to be about 5,400 gallons per day (gpd) during the peak season and 3,500 gpd during the off season. The applicant estimates that the total water use for aggregate processing is about 594,000 gallons per year or 1.8 acre-feet per year (afy).

Water used for dust suppression is sprayed by water truck on the haul roads, quarry floor, and stockpiles. A summary of the annual water use, based on seasonal conditions

[12] The applicant has stated that the quarry may operate up to 5 nights per year in an emergency situation, but generally will not have lighting at night.

is summarized in the Table 3-2 below[13]. The applicant estimates that existing dust suppression activities require about 720,000 gallons of water per year or 2.2 afy. As shown in Table 3-2, the total existing water demand for aggregate processing and dust suppression is estimated to be about 1,313,500 gallons per year.

Proposed Demand[14]

Future water demand at the quarry will increase primarily due to the relocation of the wash plant operation from the City of Willits to the quarry and due to increases in production rates. The new wash plant (currently installed at the quarry, but non-operational) will use a press to remove the water from the fines more quickly and completely. The wash plant will operate for approximately 65 days during the peak season and 40 days during the non-peak season. Most of the water used for aggregate washing will be recycled using a 20,000-gallon tank in lieu of a pond. The wash plant will require about 10,000 gallons per day (gpd) of make-up water. The applicant estimates that a total of 1,050,000 gallons will be used annually for washing.

Aggregate processing will increase from an average of 217 tons/hour to an average of 300 tons/hour, and the number of days processing occurs will increase. During the peak season, this increase in production rates will increase the average water use for processing from 5,500 gpd for a 90-day period to 7,500 gpd for a 105-day period. The peak use during this period will increase from 6,250 gpd to 10,000 gpd, due to the increase in processing rates, which will occur for an estimated 30-35 days per year during the driest time of the year. The total water demand for aggregate processing will increase from about 593,500 gallons per year to about 1,103,800 gallons per year. A more detailed summary of the production rates and water uses are shown in Table 3-2.

It is anticipated that the water used for dust suppression will increase slightly because of the increase in operating days. Currently, the water use for dust suppression is estimated to be 720,000 gallons/year. This will increase to 804,000 gallons/year. Should there be any need for water reduction for the project, the applicant can reduce the water use for dust suppression by applying lignin, a dust suppressant made from a natural timber by product, to the quarry floor. The applicant has requested that they be allowed to use either water or lignin for dust control. Table 3-2 water use is based on using water for dust suppression.

As noted in Table 3-2, the applicant anticipates that the amount of water used per day will vary depending on quarry operations and seasonal conditions. Overall the maximum water demand during the peak season is estimated to be around 19,180 gpd on days when both aggregate processing and washing are occurring. The average water demand during the peak season is estimated to be approximately 17,380 gpd. The applicant estimates that processing, washing, and dust suppression will require a total of 2,957,800 gallons of water per year.

[13] Table supplied by the applicant and used in Ludhorff and Scalmanini Water Analysis of November 2010

[14] The water demand for the project is estimated to be 2,957,800 gallons per year per Table 3-2, which is significantly less than the water demand of 500 single family homes, estimated to be 54,750,000 gallons/year (300 gallons/day/household).

Table 3-2
Existing and Proposed Harris Quarry Water Demand

Season[1]	Water Use	Period	Existing					Proposed				
			Processing Rate (tons/hr)	Daily Demand (gal)	No. of Days	Total Water Demand (gal)	Pumping Rate[2] (gpm)	Processing Rate (tons/hr)	Daily Demand (gal)	No. of Days	Total Water Demand (gal)	Pumping Rate[2] (gpm)
Peak Season	Processing[3]	2 days/week	250	6,250	30			400	10,000	35		
		4 days/week	200	5,000	60			250	6,250	70		
		Average or Total	217	5,417	90	487,530		300	7,500	105	787,500	
	Washing	4 days/week		-	-	-			10,000	65	650,000	
	Dust Suppression[4]	Driest Days (6 days/week)		7,200	30	216,000			7,200	30	216,000	
		Remainder (6 days/week)		4,800	90	432,000			4,800	90	432,000	
	Total	**Driest Days**		**11,263**	**30**	**337,875**	**7.8**		**19,179**	**30**	**575,375**	**13.3**
		Remainder		**8,863**	**90**	**797,625**	**6.2**		**16,779**	**90**	**1,510,125**	**11.7**
		Average or Total		**9,463**		**1,135,500**	**6.6**		**17,379**		**2,085,500**	**12.1**
Off Season	Processing[3]	2 days/week	250	4,100	10			400	6,400	20		
		4 days/week	200	3,250	20			250	4,100	45		
		Average or Total	217	3,533	30	106,000		300	4,867	65	316,300	
	Washing	4 days/week				-			10,000	40	400,000	
	Dust Suppression[4]	5 days/week		2,400	30	72,000			2,400	65	156,000	
	Total	**Average or Total**		**5,933**		**178,000**	**4.1**		**13,420**		**872,300**	**9.3**
Annual Total						**1,313,500**					**2,957,800**	

Notes:
1. Peak Season: June - October; Off Season: November – May
2, Pumping rate based on 24 hours/day during days of operation only.
3. Processing (does not occur every day): Max = 6 days/week; Average = 5 days/week
   Max Processing Rate: High = 2 days/week (no wash); Low = 4 days/ week (washing may occur, but not always)
4. Dust suppression: 6 days/week during peak season; 5 days during off season for 3 months, with no dust suppression for remainder
5. Processing requires less water during the off season because the product has a higher moisture content during crushing and screening.
6. Water use for restrooms is not included as it is considered inconsequential with respect to the primary uses.

b. Water Supply

Currently the applicant's well is used to fill an on-site 5,000-gallon tank that then services the quarry dust control equipment. The applicant owns a well (Well #1) located southwest of the intersection of Black Bart Drive and Highway 101. The applicant reports that this well has a sustained yield of 15 gallons per minute (gpm).[15] In the fall of 2009 the applicant had water analysis conducted for the well to determine if the well capacity was accurate and also to confirm that the well had no significant impact on surrounding wells, to the extent feasible. This study concluded that the well capacity is at or above the 15 gpm and that increased pumping of Well 1 will not have a measurable effect on any nearby wells or springs[16].

Well #1 is currently operated by a generator, but as described previously, the applicant proposes to extend a PG&E line to operate the well. Water from this well is piped within the road right-of-way between the quarry and asphalt processing facility to the new water tank (see below). The applicant no longer proposes to use any of the springs on the applicant's property to supply water for the project operations. If additional water is needed, the applicant will reduce water use by using lignin, modifying the processing/washing operation schedule to concentrate on wetter season conditions, or reducing production rates as appropriate.

The applicant has completed construction of a 212,000-gallon water tank on a bench above (east) of the proposed asphalt processing facility as shown on Figure 3-7. This tank and the access road to it were approved by the County through a building permit (BU 2005-762) and grading permit (BU 2005-0943) issued in September 2005 and constructed in 2006. The purpose of this tank is to provide required fireflow storage and to provide storage for quarry and asphalt processing facility operations. Secondary on-site water storage is shown in Table 3-3.

Table 3-3
Secondary Water Storage

Use	Total Capacity
Wash plant	
• make up water tank (1) (proposed)	10,000 gallons
• clarification water tank (1) (existing, unused)	20,000 gallons
Quarry dust suppression water tank (1)- (existing)	5,000 gallons

All of these secondary tanks are or will be located on the quarry floor.

[15] The applicant reports that the well was pumped for 981 hours between late September and early December, 2005 at a constant rate of 15 GPM. It was also pumped at this rate for 72 and 168 hours during pump tests conducted in March 2007 and September 2009, respectively.

[16] *Technical Memorandum, Potential Impacts of Increased Groundwater Pumping to Supply Proposed Harris Quarry Expansion*, Ludhorff & Scalmanini Consulting Engineers, November 2010.

The tank access road constructed under the previous grading permit will be eliminated with the grading of the easterly cut for the asphalt processing site. The relocation of the tank access road is shown on Figure 3-7. This tank access road will be constructed in accordance with the recommendations of the Geotechnical Report for the original access road, as it is generally in the same location. The total disturbed area to construct the revised tank access road is about 0.5 acres.

The applicant has agreed to provide any necessary tank connections requested by CAL FIRE for use in fire suppression. However, due to the fact that the tank use is primarily for process water storage, the volume of water available for fire suppression is subject to water on hand at any given time.

12. Wastewater

Toilet facilities at the quarry are portable toilets. These facilities are serviced and emptied twice per week by Roto Rooter, and not typically changed out. The new facilities at the asphalt processing site will be serviced by a permanent septic system with on-site restrooms adjacent to the scale facilities at both the processing and quarry site. The location of the septic system, which has been designed and approved by Mendocino County, is about 100 feet north of the quarry well alongside the haul road. This septic system will service 23 employees total.

13. Hazardous Materials

Explosives are used for blasting at the quarry. Typically, blasting is done three times per year. No explosives are stored on site. The blasting is done by an independent company who transports the explosives to the site and conducts the blasting.

Diesel fuel used for quarry operating equipment, including the generator, is currently stored on site in a 10,000-gallon double-containment aboveground storage tank and a 1,000-gallon tank.

Waste oil is and will be stored in a 500-gallon double-containment tank. Other than diesel fuel and waste oil, potentially hazardous substances stored and used on the quarry site consist of various types of lubricants, oils, diesel additives, gasoline, and hydraulic fluids. These will all be stored with double-containment protections

14. Air Quality

The applicant has an existing Air Quality Permit to Operate from the Mendocino County Air Quality Management District (MCAQMD) for the existing quarry (Permit No. 1070-4-01-90-44-2 and Permit No. 1070-4-01-08-16 for the generator) and the existing concrete facility in Willits (Permit No. 1320-5-01-05-42-1). Dust abatement controls will be in accordance with the Air Quality Resource Board Standards for Mendocino County. Dust reduction will be achieved by watering the roadways during hauling periods, wetting the surge pile, and keeping adequate moisture in the processed material to minimize the creation of airborne particles. Each stacker conveyor has a water mist system to control dust. As per Mendocino County Air Quality requirements, this site has been tested for the existence of asbestos in serpentine soils, and no asbestos-form minerals were detected.

15. Employees

The quarry currently has about 8 employees working at the site, 3 people trucking aggregate materials and 5 off-site employees including 2 mechanics and 3 administration personnel. Once the wash plant is operational at the quarry site, this will add one additional full-time person on the quarry site.

F. Asphalt Processing Facility

1. Site Development

As shown on Figure 3-7, the asphalt plant will be constructed on a 3.5-acre pad. The disturbed area, including fill slopes, would be about 5.7 acres. The pad location will be created by cutting material from the north and east sides of the site and using that cut material to fill the southern and western side of the site to form an almost level pad. Approximately 60,000 cubic yards of material will be cut, with the fill utilizing the majority of this material, and the balance being used for the new entrance road at the highway. No material will be removed from the site. A geotechnical investigation of the site and proposed project has been submitted by the applicant. This study recommends mitigations and concludes that the site will be stable given implementation of those measures.[17] This report is on file with the Mendocino County Department of Planning and Building Services.

The project was designed so existing tree stands would border the side of the site facing Black Bart Drive. Additional trees are being planted to further screen the plant where no tree stands exist between the asphalt processing site and Black Bart Drive. These trees both create screening and increase ground stability for the project. The pad does not include any cuts or fills in drainage channels.

2. Asphalt Facility

The applicant proposes to construct and operate an asphalt facility on the site. The proposed plant will be a Hot Mix Asphalt (HMA) facility utilizing new technology equipment. The plant will be a 300 tons-per-hour (TPH) Astec counterflow drum mix facility ("Astec Stationary Drum type facility"), or equivalent from another manufacturer, and will typically include the following: 5 cold feed bins, 1 recycle bin, two scalping screens, 2 feed conveyors, burner, dryer drum, slat conveyor, 2 silos, control house, motor control center, truck scale, 2 asphalt oil storage tanks, 1 hot oil heater, dust collector baghouse and knock out box. The location of these facilities is shown on Figure 3-7, and details are shown on Figure 3-9. The total height of the facility will not exceed 75 feet. The silos, which look like grain silos on a farm, are the tallest structures at the facility. The tall elevation is needed to allow for a surge of material to be stored, and for gravity to discharge it to the trucks. The next highest structures are the AC tanks, which are approximately 50-55 feet in height and then the baghouse and its ducting, which typically stands 25-30 feet high. All the other structures are approximately 12 feet in height. Stockpiles will be placed on the north side of the asphalt processing site to aid in screening the silos and other mechanics of the asphalt plant.

[17] *Geotechnical Evaluation, Harris Quarry Processing Facilities, Willits, California,* Blackburn Consulting, Inc., March 28, 2005.

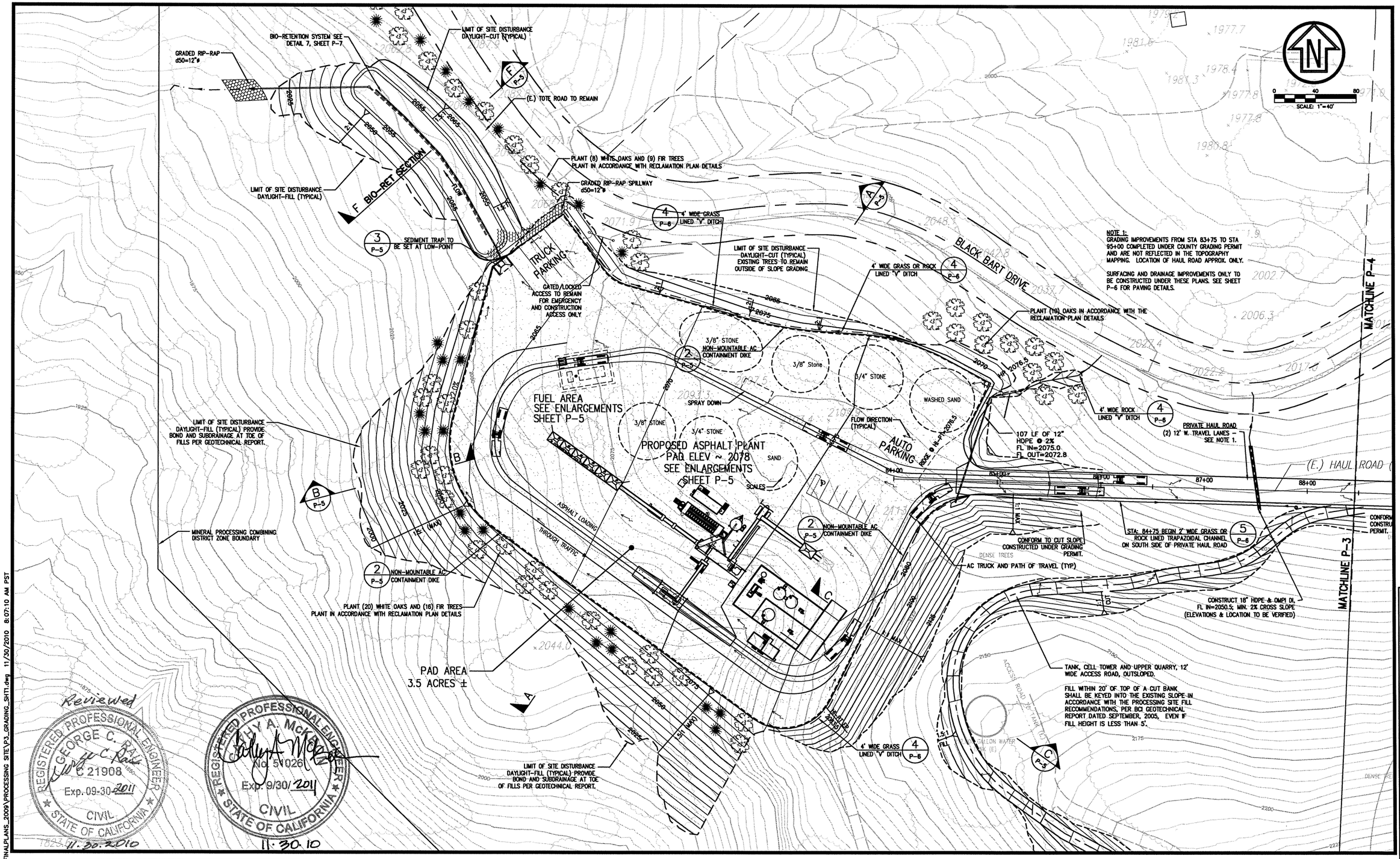
The asphalt process starts when selected gradations of aggregates are placed into cold feed hoppers with a front end loader. These hoppers are regulated through a central computer in the control house that meters out the appropriate quantities for a specific mix design. Upon exiting these hoppers, the materials collect on a conveyor and run through a single screen. This screen is in place to ensure that no large and/or foreign objects enter the process. Once through the screen, another conveyor transfers the materials to the drier drum, where they are then heated. Counterflow technology will be used, which will result in decreased air emissions. With counterflow technology, aggregates travel in the opposite direction as the heating flame. Older style parallel flow drums operated where the burner (heat source) and the aggregates were introduced at the same point, and the asphalt oil was injected part way through. The direct heat (flame) had far more contact with the oil and recycled asphalt pavement (RAP) and through this contact would create visible "blue smoke" emissions (a visible and odorous source historically associated with asphalt operations). With the counterflow drums, aggregates are first heated, then moved to an isolated zone where oil and RAP are introduced. This lack of direct heat contact reduces the amount of unwanted emissions. RAP is introduced through the same process as virgin aggregates, except that it typically enters the drum through a midway point for mixing. Once all these items are adequately heated and mixed, at around 300 degrees, they are discharged onto a conveyor that then places them in the heated storage silos. Trucks stage under the silos and are filled via gravity from the silos above. A scale under the truck ensures that the requested load is delivered. The baghouse effectively pulls all the air through the drier drum and filters out the fine Particulate Matter (PM). This fine particulate matter is then metered back into the system for use in the asphalt product. Other new systems include a blue smoke recovery unit that ducts the gasses back from the silo loading and other transfer points to the burner, where it is then heated up and destroyed. This system uses a fan that creates a vacuum and then injects the flow into the burner's air stream. Also at the truck load out area, a negative draft system (again a fan) is used to capture any vapors that occur during dumping. These vapors are then condensed, and the resulting product is then burnt through the system.

For purposes of the EIR analysis of air quality, it will be assumed that the new asphalt facility will at least meet EPA's AP-42 emission standards.[18]

Aggregates will be supplied from the Harris Quarry site via the proposed internal haul road. Stockpiles will be kept at the plant site and will vary in size from 50 to 2,000 tons. Materials from outside, such as Blend Sand (2,000 tons per year) and recycled asphalt (RAP) (up to 20,000 tons per year), will also be stored on the plant site. See Figure 3-7 for the estimated stockpile locations and sizes.

Total production for the asphalt facility will be determined by market demand, but would not exceed 150,000 tons (about 58,280 CY) per year, and not more than 3,000 tons per day. Since government budgeting and spending largely determines the material demand, estimating the long-term demands becomes speculative. Most operations will occur during the drier months, with a daily operating average of approximately 50 tons per hour (TPH). A plant maximum of 300 TPH will be possible. The duration of nighttime operations is

[18] U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors*, Section 11.19.2 (Crushed Stone Processing), August 2004, and Section 11.1 (Hot Mix Asphalt Plants), March 2004.



Reviewed
REGISTERED PROFESSIONAL ENGINEER GEORGE C. RAU C 21908 Exp. 09-30-2011 CIVIL STATE OF CALIFORNIA
11.30.2010

REGISTERED PROFESSIONAL ENGINEER CATHY A. MCKAY No. 51026 Exp. 9/30/2011 CIVIL STATE OF CALIFORNIA
11.30.10

DATE:	REVISION:	BY:
NOV. '10	REVISED FOR AC PLANT, TANK AND HAUL ROAD	CAM
JAN. '10	REVISED FOR SINGLE PHASE, 8,000,000 CY AT 30 YR.	CAM
SEPT. '06	CLIENT COMMENTS (REVISED HAUL ROAD)	CAM
AUG. '05	CLIENT COMMENTS (ROTATED PPC AND AC PLANTS)	MDP
MARCH '05	INITIAL SUBMITTAL	MDP

DATUM INFORMATION:
VERTICAL DATA: NAVD 1929
HORIZONTAL DATA: SEE SHEET P-1

BOUNDARY REFERENCE:
RECORD OF SURVEY PREPARED BY THOMAS HERMAN, AUG. 1991, FILED IN CASE 2, DRAWER 54, PAGE 47. MENDOCINO COUNTRY RECORDER'S OFFICE

TOPOGRAPHICAL SURVEY REFERENCE:
TOPOGRAPHICAL INFORMATION IS BASED ON AN AERIAL SURVEY PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES (JUNE 2004); THIS MAP WAS PREPARED USING COMPUTER ASSISTED PHOTOGRAMMETRIC METHODS PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES) PHOTOGRAMMETRY IN AREAS OF DENSE VEGETATION MAY BE COMPROMISED AND ACCURACY OF CONTOURS MAY DEVIATE FROM ACCEPTED ACCURACY STANDARDS.

CLIENT & OPERATOR:
NORTHERN AGGREGATES, INC.

PROJECT LOCATION:
PROPOSED PROCESSING FACILITY
APN: 147-140-07 & 147-180-013
MENDOCINO COUNTY, CALIFORNIA

RAU AND ASSOCIATES INC.
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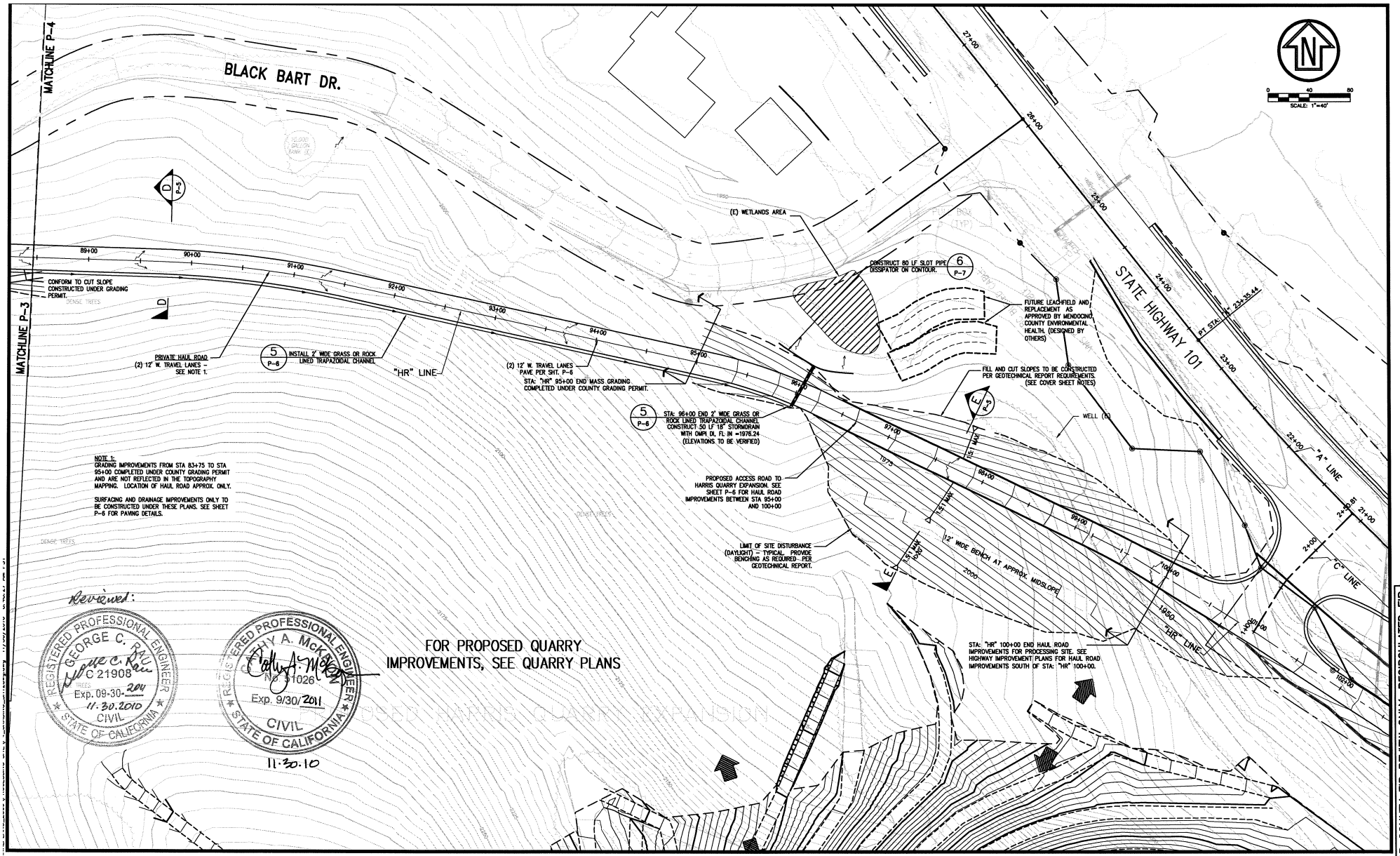
DRAWING:
GRADING & DRAINAGE PLAN
(SHEET 1 of 2)

Date:	MARCH 2005
Scale:	AS SHOWN
Design/Drawn:	MDP
Checked:	CLIENT/MDP
Reviewed:	GCR
JOB NO.	R04056.0

Figure 3-7

VERSION: FOR COUNTY EIR REVIEW ONLY; RECIRCULATED EIR

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DATE:	REVISION:	BY:
NOV. '10	REVISED FOR AC PLANT, TANK AND HAUL ROAD	CAM
JAN. '10	REVISED FOR SINGLE PHASE, 8,000,000 CY AT 30 YR.	CAM
SEPT. '06	CLIENT COMMENTS (REVISED HAUL ROAD)	CAM
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MARCH '05	INITIAL SUBMITTAL	MDP

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VERTICAL DATA: NAVD 1929
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CLIENT & OPERATOR:
NORTHERN AGGREGATES, INC.

PROJECT LOCATION:
PROPOSED PROCESSING FACILITY
APN: 147-140-07 & 147-180-013
MENDOCINO COUNTY, CALIFORNIA

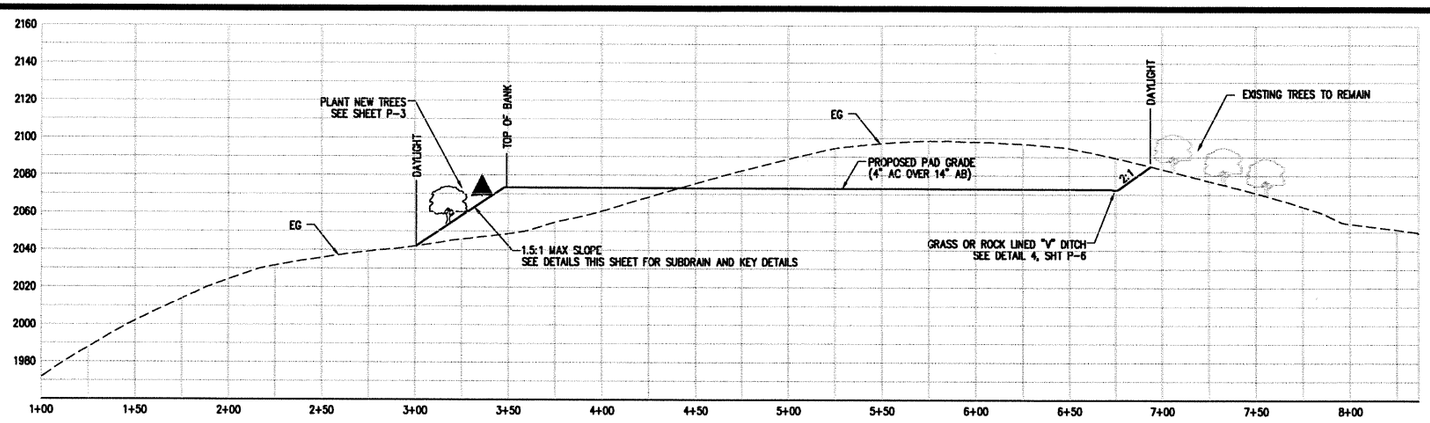
RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET · (707) 462-6536 · UKIAH, CA 95482

DRAWING:
GRADING & DRAINAGE PLAN (SHEET 2 of 2)

Date:	MARCH 2005
Scale:	AS SHOWN
Design/Drawn:	MDP
Checked:	CLIENT/MDP
Reviewed:	GCR
JOB NO.	R04056.0

Figure 3-8

VERSION: FOR COUNTY EIR REVIEW ONLY; RECIRCULATED EIR



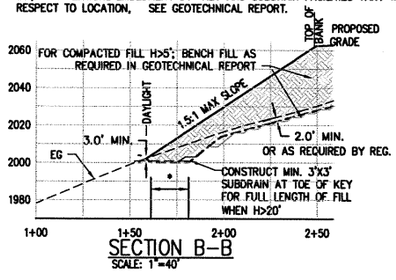
SITE SECTION A-A
SCALE: HORZ. & VERT. 1"=40'

GRADING NOTES:

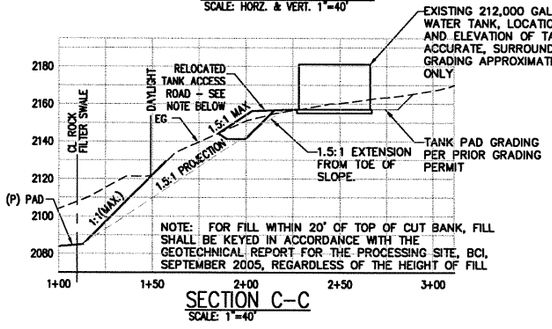
1. CHANNEL WIDTHS AND TYPES SHALL BE AS NOTED ON THE PLANS AND CONSTRUCTED IN ACCORDANCE WITH APPLICABLE DETAILS ON THIS SHEET P-6. SEE ALSO DRAINAGE ANALYSIS PREPARED BY RAU AND ASSOCIATES, INC. AMENDED FEBRUARY 2010.
2. TURF REINFORCING MAT SHALL BE INSTALLED IN GRASS LINED DITCHES WITH VELOCITY > 5 FPS. TRM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND AS DIRECTED BY ENGINEER.
3. WHERE NO CHANNEL IS NOTED ON PLANS, A DIKE SHALL BE INSTALLED ON CUT SECTIONS.
4. SLOPES VARY WITH CUT/FILL HEIGHT, SEE SECTIONS SHEET P-5 AND P-6 AND GEOTECHNICAL REPORTS. GRADING WITHIN HIGHWAY RIGHT OF WAY SHALL BE CONTROLLED BY HIGHWAY CHANNELIZATION PLANS AND CALTRANS ENCROACHMENT PERMIT.
5. ROAD GRADING BETWEEN STA: 83+75 AND 95+00 WAS COMPLETED UNDER SEPARATE GRADING PERMIT.
6. SEE SECTION E-E FOR BENCHING REQUIREMENTS WHEN CUT HEIGHT EXCEEDS 30'.
7. SUBGRADE SHALL HAVE A MIN. R-VALUE OF 18- IF LESS THAN 18, STRUCTURAL SECTION SHOULD BE RE-EVALUATED.
8. ALL GRADING, SUB-DRAINAGE AND KEYS AT TOE OF FILL TO BE COMPLETED PER THE REFERENCED GEOTECHNICAL REPORTS. INSPECTIONS ARE REQUIRED BY STATE OF CALIFORNIA CERTIFIED ENGINEERING GEOLOGIST (CEG) FOR KEY CONNECTIONS AND SUB-DRAINS PRIOR TO CONSTRUCTING FILL AND FINISHED SLOPES.

REGISTERED PROFESSIONAL ENGINEER * CATHY A. McKEE * No. 51026 Exp. 9/30/2011 CIVIL * STATE OF CALIFORNIA *
11.30.10

* KEY REQUIRED WHEN FILL H>5'. BASE KEY WIDTH VARIES BETWEEN 10' AND 20'; MIN. VERTICAL EMBEDMENT 3'. KEY AND SUBDRAIN FACILITIES VARY WITH RESPECT TO LOCATION, SEE GEOTECHNICAL REPORT.

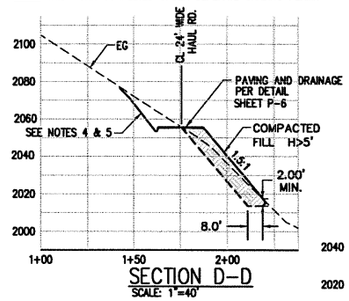


SECTION B-B
SCALE: 1"=40'

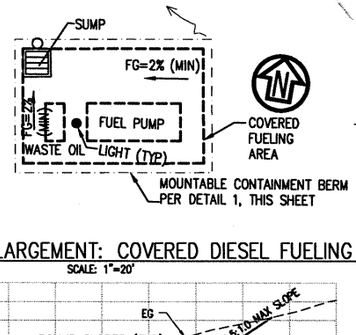


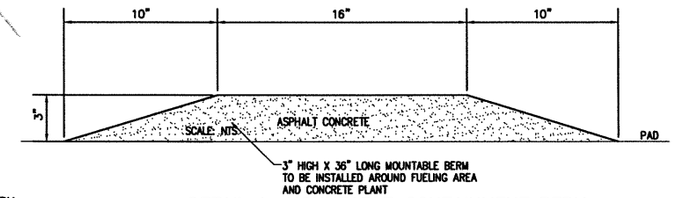
SECTION C-C
SCALE: 1"=40'

NOTE: THIS WORK COMPLETED UNDER SEPERATE GRADING PERMIT



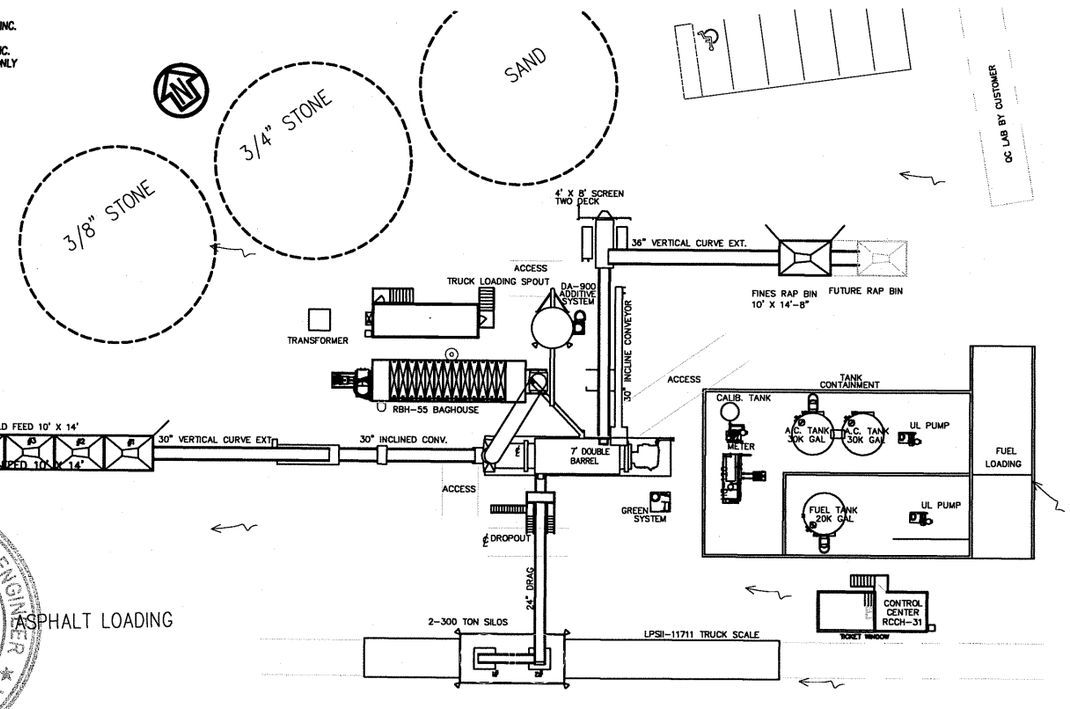
SECTION D-D
SCALE: 1"=40'





DETAIL 1: MOUNTABLE CONTAINMENT BERM

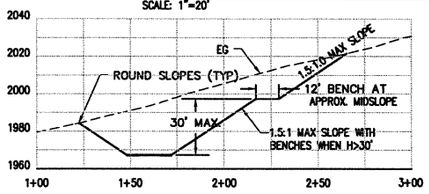
NOTE: AC PLANT LAYOUT BY ASTEC, INC. FOR DETAILED PLANT PROFILES, SEE PLANT PROFILE EXHIBITS BY ASTEC, INC. PLANT CONFIGURATION APPROXIMATE ONLY AND SUBJECT TO MODIFICATION.



Reviewed:
REGISTERED PROFESSIONAL ENGINEER * GEORGE C. RAU * C 21908 Exp. 09-30-2011 11-30-2010 CIVIL * STATE OF CALIFORNIA *

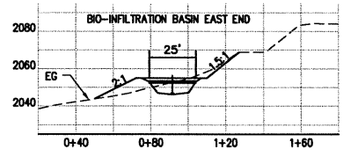
ENLARGEMENT: HOT MIX PLANT
SCALE: 1"=20'

ENLARGEMENT: COVERED DIESEL FUELING AREA
SCALE: 1"=20'

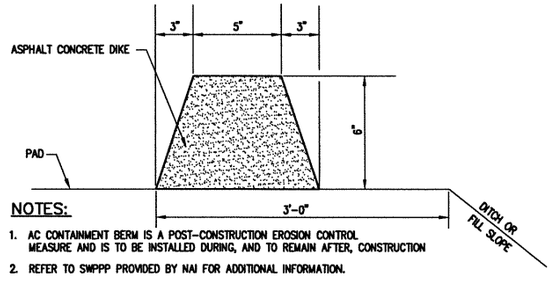


SECTION E-E
SCALE: 1"=40'

SEE ALSO DETAIL-5, SHEET P-7

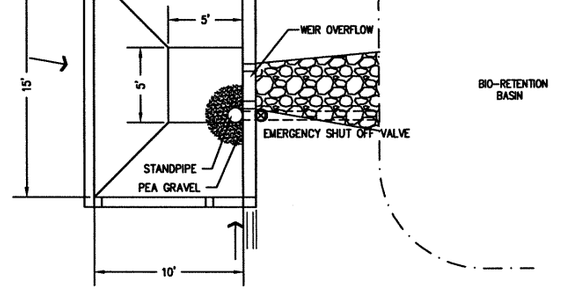


SECTION F-F
SCALE: 1"=40'

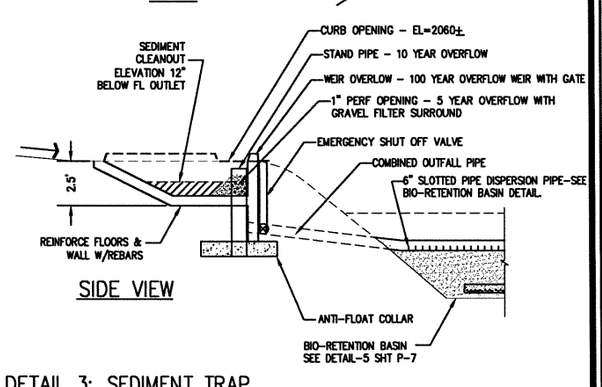


NOTES:
1. AC CONTAINMENT BERM IS A POST-CONSTRUCTION EROSION CONTROL MEASURE AND IS TO BE INSTALLED DURING, AND TO REMAIN AFTER, CONSTRUCTION
2. REFER TO SWPPP PROVIDED BY NAI FOR ADDITIONAL INFORMATION.

DETAIL 2: NON-MOUNTABLE CONTAINMENT DIKE
SCALE: NTS



PLAN



SIDE VIEW

DETAIL 3: SEDIMENT TRAP
SCALE: NTS

DATE:	REVISION:	BY:
NOV. '10	REVISED FOR AC PLANT, TANK AND HAUL ROAD	CAM
JAN. '10	REVISED FOR SINGLE PHASE, 6,000,000 CY AT 30 YR.	CAM
SEPT. '06	CLIENT COMMENTS (REVISED HAUL ROAD)	CAM
AUG. '05	CLIENT COMMENTS (ROTATED PPC AND AC PLANTS)	MDP
MARCH '05	INITIAL SUBMITTAL	MDP

DATUM INFORMATION: VERTICAL DATA: NVGD 1929 HORIZONTAL DATA: SEE SHEET P-1

BOUNDARY REFERENCE: RECORD OF SURVEY PREPARED BY THOMAS HERMAN, AUG. 1991, FILED IN CASE 2, DRAWER 54, PAGE 47. MENDOCINO COUNTRY RECORDER'S OFFICE

TOPOGRAPHICAL SURVEY REFERENCE: TOPOGRAPHICAL INFORMATION IS BASED ON AN AERIAL SURVEY PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES (JUNE 2004); THIS MAP WAS PREPARED USING COMPUTER ASSISTED, PHOTOGRAMMETRIC METHODS PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES) PHOTOGRAMMETRY IN AREAS OF DENSE VEGETATION MAY BE COMPROMISED AND ACCURACY OF CONTOURS MAY DEVIATE FROM ACCEPTED ACCURACY STANDARDS.

CLIENT & OPERATOR: NORTHERN AGGREGATES, INC.

PROJECT LOCATION: PROPOSED PROCESSING FACILITY APN: 147-140-07 & 147-180-013 MENDOCINO COUNTY, CALIFORNIA

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET · (707) 462-6536 · UKIAH, CA 95482

DRAWING: DETAILS AND TYPICAL SECTIONS

Date:	MARCH 2005
Scale:	AS SHOWN
Design/Drawn:	MDP
Checked:	CLIENT/MDP
Reviewed:	GCR
JOB NO.	R04056.0

Figure 3-9

VERSION: FOR COUNTY EIR REVIEW ONLY; RECIRCULATED EIR

Z:\R04056\drawing\FINALPLANS_2009\PROCESSING SITE\P5-6-7_DET-PRO-SECT.dwg 11/30/2010 9:25:56 AM PST

again unknown; however, typically they would not make up more than 10% of the total plant tonnage for that year, usually 5 nights. However as a worse case scenario, the EIR will assess the possibility of 100 days (50% of the yearly schedule) per year of operations that fall outside the typical schedule. This amount of nighttime operations would only occur in conjunction with a large government paving project. These sorts of projects normally only occur in Mendocino County once every 20 years. This nighttime work always occurs at the request of Caltrans or the County Department of Transportation. Typically, these are requests to help reduce daytime traffic congestion and increase worker safety by producing a more traffic-free workplace. Additionally, as part of the newer technology, the asphalt silos will be heated and thus allow for asphalt to be held after being made for up to a week. Since the proposed silos have a total 300 ton capacity, any night job 300 tons or less will simply be loaded out at night without the need for plant start up. Additionally, this ability to have asphalt ready on demand will help eliminate the startup fees that currently are charged for smaller quantities of asphalt.

3. Material Handling

Aggregate will be transported from the quarry via one to two applicant-owned trucks. Three to four types of aggregate will be stockpiled as shown in Figure 3-7. One 980 or smaller sized wheel loader will move the materials from the stockpiles into the plant feeders.

Asphalt oil will be delivered on an as-needed basis. Asphalt oil is typically delivered by tanker trailers to the facility. The unloading of this product happens within the tanks' containment area through 4-inch hoses and heated pumps. Unlike other oils, asphalt oil does not have the ability to leach or travel. Once it is at ambient temperature, it will solidify. Storage of the asphalt oil is in the storage tanks in the containment area shown on Figure 3-7.

Bio-diesel, soy oil, or a similar vegetable-based material will be used as the release agent for asphalt delivery trucks. This chemical allows the asphalt to release from the truck beds without sticking, and helps prevent lumping. These materials are sprayed into the truck beds prior to loading and do not require removal or disposal. (They work similarly to putting butter on a cookie sheet.) It will be received in totes (i.e., barrels) and stored near the application area.

The hot mix asphalt will be loaded out via a silo surge system. This process works by positioning a truck under the load out area and placing the required mix amount into the truck bed via gravity feed. There are no chemicals or loss of material during this procedure. Once full, the truck pulls out of the loading bay and proceeds to the job site.

4. Recycled Material

Recycled Asphalt Pavement (RAP) will be received at the quarry processing facility. It will be ground up and reused in asphalt production; it will be stored at the asphalt processing facility site. Similarly, some concrete will be ground up and used for recycled concrete slurry mix. All the remaining mixed concrete and asphalt will be ground up together and sold as envirobase, (a completely recycled materials product) from the quarry site. Envirobase, in most situations, can be used as an alternative to virgin base rock material.

5. Hours of Operation

The asphalt plant will primarily have personnel on-site during the day between 6 a.m. and 5 p.m., however, to fulfill customers' needs some nighttime operations will occur. The majority of the actual load out and equipment operations will occur from 6 a.m. until 2 p.m. Night work is often a safer alternative to working during the day when high traffic flows are present on haul routes; it will be important to cater to these projects. Silos with overnight storage capacity will be used to help reduce nighttime operations. Proposed hours are:

- Asphalt operations: 6 a.m. - 5 p.m.
- Equipment running: 6 a.m. - 4 p.m.

These are the proposed hours during the busiest time periods; on average the hours and volumes will be far less than what is being proposed. The asphalt operations will typically only operate from Monday to Friday, 5 days a week. The operations times indicate when plant personnel may be present. The equipment running time indicates when 90% or more of the actual equipment operating and processing occurs. As a worst case scenario, these operations could occur up to 10 hours within a 24-hour period. Weekend operations would be for asphalt production and loading for specific projects only. The facility would be open to the general public by appointment only.

As a worst case scenario, the asphalt operation could occur during the nighttime hours. This nighttime operation could, in a worse case year, be 100 nights or 50% of the total yearly schedule. This would be an extreme year and would be likely to occur at this magnitude rarely, due to an emergency project or very large project, such as the Willits Bypass. Even though nighttime operations more than 5 nights a year would be rare, this EIR assesses a worst case where nighttime operations up to 100 nights per year could occur every year

Since the asphalt plant will have heated silos, it would be probable that the nighttime plant operations would be decreased when compared to normal daytime operations. Heated silos allow for materials to be made during the day and stored until night. This then allows for materials to be loaded out at night without needing to start the full plant operations. Up to 300 tons could be stored for nighttime load out. The process operations location has been chosen such that minimal exposure to any sensitive receptors would occur during daytime or nighttime operations. Also this consolidation of operations in a rural area reduces the impacts of potentially having two separate locations in use.

6. Access and Circulation

Vehicles will access the asphalt processing site via the new internal 24-foot wide haul road that connects to the quarry and to Highway 101 (see Figure 3-8). The applicant has graded the majority of the existing 24-foot wide access road under an existing approved grading permit and has also constructed the road to the project well from Black Bart Drive. The haul road and the asphalt processing site will be paved and the tank access road rerouted to allow the grading for the asphalt processing site. A geotechnical study was prepared for the grading of this road, the water tank and the access road to the water tank. The conclusion of the report determined that the road and tank would be stable given

implementation of mitigation measures included in that report.[19] Although the Geotechnical Report was written for the original tank access road, the relocated tank access road is essentially in the same location and as such was used for the design of the relocated access road. Employee and auto parking will be located near the northeast corner of the site. Truck parking is provided at the west end of the site.

During loading operations the trucks will enter the asphalt processing site and follow a circular pattern as shown on Figure 3-7 and leave via the haul road. Sufficient room is provided to allow asphalt loading circulation, both truck and employee parking and for fueling operations.

7. Drainage and Water Quality

The pad will be graded to drain to the west. Runoff from areas upslope of the asphalt processing site will be diverted away from the processing pad. The processing pad (about 3.5 acres) will slope at an approximate 2% grade to a common sediment clean-out basin that then outlets to a bio-retention basin, as shown on Figure 3-7.

The fueling area will have its own dedicated grading zone and be covered. The area will drain to a common sump, where any spilled materials could be cleaned up. This will prevent storm water from entering the fueling area and isolate any spill. The diesel tank supplying the fuel will be double walled and fully enclosed in the "tank farm" containment area to the east. Piping will be used to transport the fuel from the diesel tank to a pump at the fueling area. The fueling area pad will be poured with concrete in order to create a non-pervious ground cover.

A permanent berm/curb will be constructed around the perimeter of the processing pad to ensure that no water is able to leave the site except through the dedicated routes. This curb will also restrict the inflow of water to the site from the surrounding area. The berm/curb will direct all pad waters to the clean-out basin. A shallow drive-over curb will also be present around the fuel area. This curb will allow access into the areas while restricting stormwater from flowing into the fueling area.

One sediment clean-out basin will be constructed on the site. This basin will allow for sediment retention prior to flowing over to the proposed bio-retention area. Flow-over will be through a gooseneck style drain as described below. The basin will be mucked out prior to heavy rainfall events, and when needed to ensure that adequate sediment retention volumes remain. Since the majority of aggregate stockpiles on this site are either previously washed materials, or crushed clean materials and because the site is paved and all swales are rocked or vegetated, it is anticipated that the amount of silt contributed to this exit basin each season will be very negligible.

The bio-retention area will be fed via a 12-inch pipe from the clean-out basin. Once into the bio-retention area, a slotted pipe will be used to disperse the water in a fashion that simulates sheet flow. The bio-retention basin will contain and filter possible pollutants that are transported with stormwater. The basin is designed to filter pollutants from an 85 percentile storm event and is sized in accordance with the Caltrans basin sizing

[19] *Geotechnical Report – Service Road and Water Tank*, Blackburn Consulting, Inc., August 18, 2005.

methodology. The basin includes a filter media with a liner beneath the filtering material (to prevent downslope saturation) and a perforated pipe that will capture filtered storm water and divert it to the existing channel, west of the basin through a perforated pipe and a 12-inch outlet pipe. An 18-inch stand-pipe installed in the basin for the 100-year storm event is also included to ensure that larger storm events can be accommodated and passed through the basin. The basin will physically measure 25 feet wide by 215 feet long. Approximately 4 to 5 feet of sandy loam with an additional 1 to 2 feet of drain rock with piping will be placed underneath. Trees (including oaks) and shrubs will be planted in the bio-retention area. A rock-lined ditch will transport water from the outlet of the bio-retention swale to the existing swale. Detailed design of the rock-lined ditch will be performed during preparation of the Storm Water Pollution Prevention Plan (SWPPP). The outlet of this basin will be an observation and testing location to be included in the SWPPP. The SWPPP will also require inspection of the downslope swale.

Stone filter swales will be installed in areas where higher velocities of water from off the site might flow towards the site. These swales will help to create a non-erosive pathway for the water to travel once it reaches the pad location. In areas with lower volumes of runoff and flatter slopes, grass swales may be used in lieu of rock-lined swales. The only areas that could contribute to this would be the hillside to the east. The water from the east hillside will continue to travel through in the same route as it currently does, traversing southwards through an existing swale. Since the remaining terrain to the north, south and west are below, or break away from, the pad, there will not be any rerouting needed at those edges. The smaller pad section on the east side will also flow into a filter swale prior to being outlet into the drainage swale to the north adjacent to Black Bart Drive. Site roads between the process facility and the quarry will be graded with uphill drainage ditches that will control the runoff upslope of the road and divert them to two culverts. The location of these culverts are shown on Figures 3-7 and 3-8. The upper culvert, nearest the asphalt processing site pad, will outlet near the existing water tank, where there is a natural swale that leads to the drainage ditch on the south side of Black Bart Drive. The lower culvert, nearer the entrance, will be outlet and dispersed just upslope of an existing vegetated wetland area and is considered to be a wetland enhancement.

Construction of the Highway 101 improvements, as requested by Caltrans, and as shown on Figure 3-6, will require that the haul road be shifted west of the existing access road from the entrance to the quarry. This improvement will require filling an existing 2,300-square foot highway drainage channel. This drainage channel was constructed when Highway 101 was reconstructed in the 1960s. The drainage will be reconfigured with a series of culverts to provide safe drainage to the current outlet at the base of the existing slope below the quarry. Construction of these highway improvements will also require removal of an existing marginal wetland of approximately 0.01 acre[20] on the west side of Highway 101. This wetland is upslope and along a short portion of the existing haul road. An additional potential wetland on the northeast side of the Highway 101 was identified. Widening of Highway 101 on the east side will require removal of approximately 0.03 acre[20] of this wetland. Mitigation will be required for removal of the existing marginal wetlands and filling of the channel. The total wetlands removal would be approximately 0.04 acres.

[20] Estelle Clifton, email dated January 8, 2011. Wetland areas are approximate only. Jurisdictional delineations will be finalized in spring of 2011 and coordinated with Army Corp of Engineers.

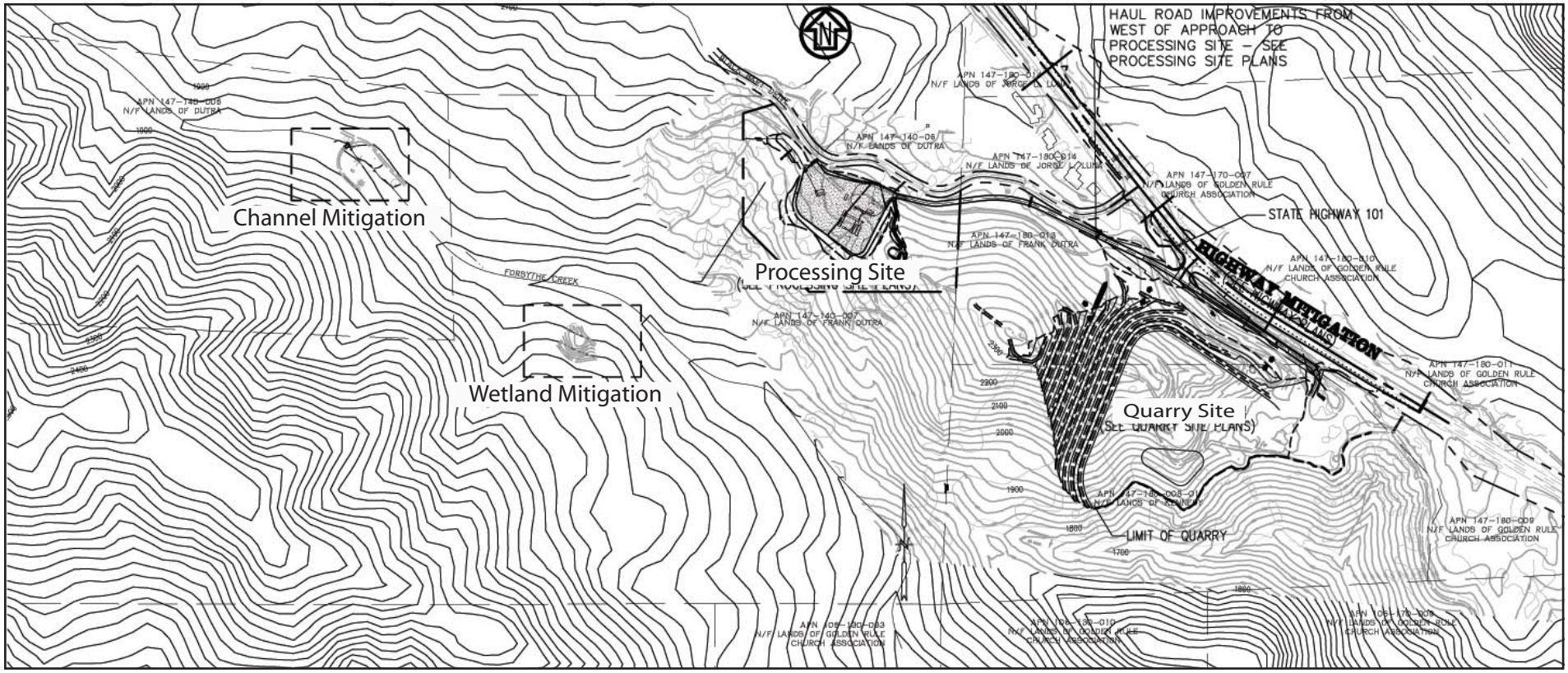
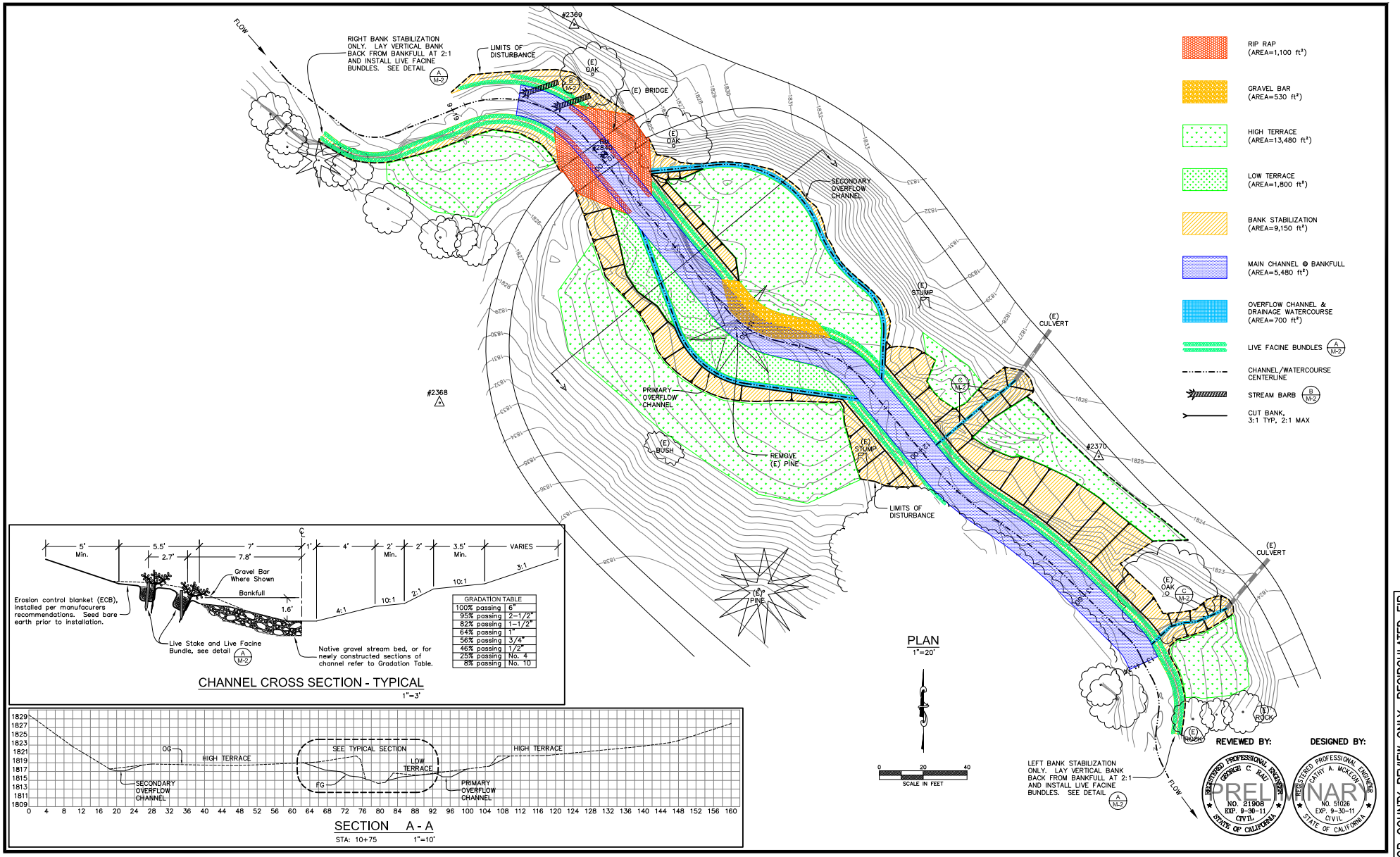


Figure 3-10
Location of Wetland and Channel Loss Mitigation Sites



PLAN
1"=20'

0 20 40
SCALE IN FEET

CHANNEL CROSS SECTION - TYPICAL
1"=3'

SECTION A - A
STA: 10+75 1"=10'

REVIEWED BY: DESIGNED BY:

REGISTERED PROFESSIONAL ENGINEER GEORGE C. RAU NO. 21908 EXP. 9-30-11 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER CATHY A. MCKEON NO. 51026 EXP. 9-30-11 CIVIL STATE OF CALIFORNIA

PRELIMINARY

DATE:	REVISION:	BY:

COMPUTER NO:
PATH:
FILE:
PSVIEW:
MSVP:
MSVIEW:

VERIFY SCALE
0 1/2 1 2 3
BAR REPRESENTS THREE INCHES ON ORIGINAL

USE OF THIS DOCUMENT, INCLUDING THE INCORPORATED DESIGNS, IS AN INSTRUMENT OF SERVICE FOR THIS PROJECT AND SHALL NOT BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF RAU AND ASSOCIATES INC.

OWNER: NORTHERN AGGREGATES, INC.
RIDGEWOOD SUMMIT

LOCATION: 16100 N. HIGHWAY 101
WILLITS, CA 95490

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET· (707) 462-6536 UKIAH, CA 95482

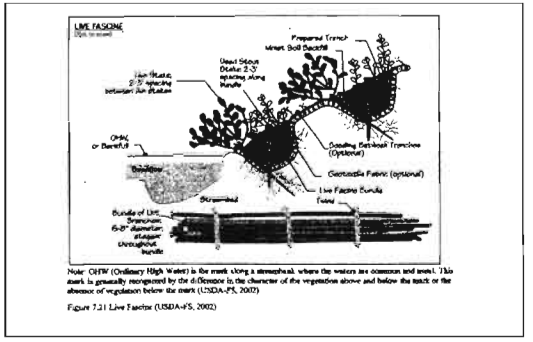
DRAWING: FORSYTHE CREEK RESTORATION IMPROVEMENT PLAN

PROJECT: HARRIS QUARRY EXPANSION MITIGATION

Date:	JAN. 2010
Scale:	AS SHOWN
Drawn:	D.R.A.
Checked:	C.A.M.
Reviewed:	G.C.R.
Job No.	R04056

Figure 3-11

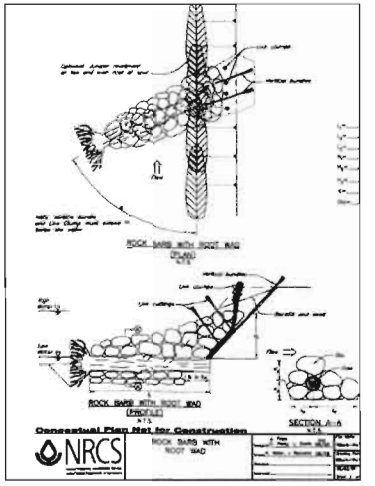
VERSION: FOR COUNTY REVIEW ONLY; RECIRCULATED EIR



Note: OHW (Ordinary High Water) is the mark along a stream/bank where the waters are common and usual. This mark is generally recognized by the difference in the character of the vegetation above and below the mark or the absence of vegetation below the mark (USDA-FS, 2002)

Figure 7.21 Live Fascine (USDA-FS, 2002)

A



B

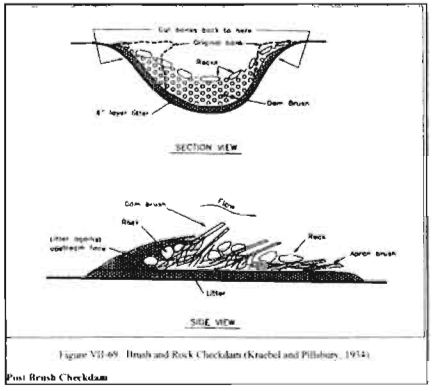
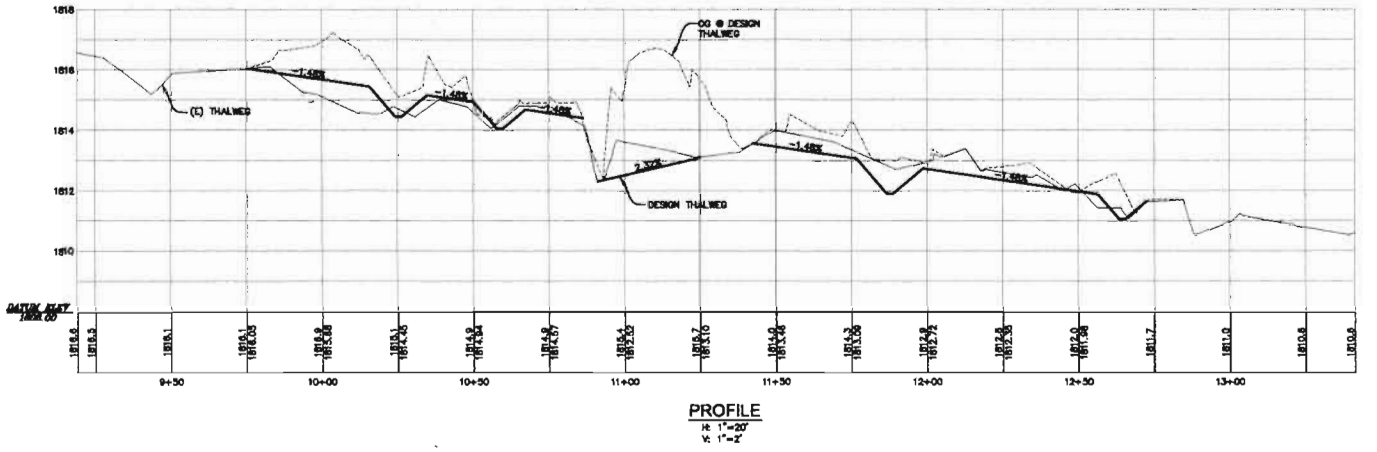


Figure VII-69 Brush and Rock Checkdam (Kraebel and Pillsbury, 1934)

Post Brush Checkdam

C



PROFILE
H: 1"=20'
V: 1"=2'

REVIEWED BY:

DESIGNED BY:

PRELIMINARY

DATE:	REVISION:	BY:

VERIFY SCALE
0 1/2 1 2 3
BAR REPRESENTS THREE INCHES ON ORIGINAL

USE OF THIS DOCUMENT, INCLUDING THE INCORPORATED DESIGNS, IS AN INSTRUMENT OF SERVICE FOR THIS PROJECT AND SHALL NOT BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF RAU AND ASSOCIATES INC.

OWNER: NORTHERN AGGREGATES, INC.
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LOCATION: 16100 N. HIGHWAY 101
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180 NORTH PINE STREET· (707) 462-6536 UKIAH, CA 95482

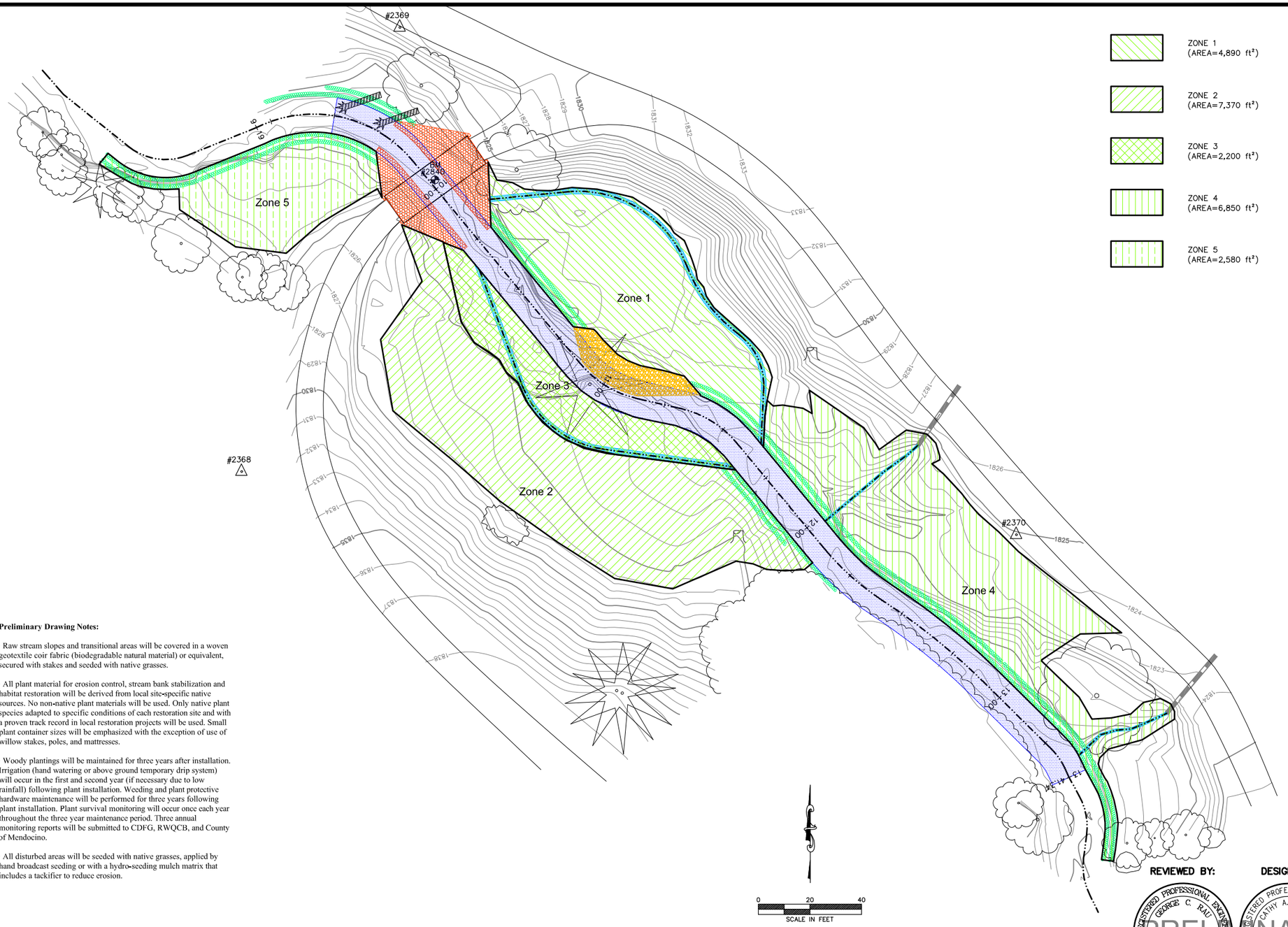
DRAWING: FORSYTHE CREEK RESTORATION
PROFILE & DETAILS

PROJECT: HARRIS QUARRY
EXPANSION MITIGATION

Date: JAN. 2010
Scale: AS SHOWN
Drawn: D.R.A.
Checked: C.A.M.
Reviewed: C.C.R.
Job No.: 804058

Figure 3-12

VERSION: FOR COUNTY REVIEW ONLY; RECIRCULATED EIR



Harris Quarry Project **Draft Candidate Species List**

Riparian Enhancement Along Forsythe Creek

Scientific Name	*Common Name*
Acer macrophyllum	Big leaf maple
Aesculus californica	California buckeye
Arctostaphylos manzanita	Common manzanita
Baccharis pilularis	Coyote bush
Corylus cornuta	Hazelnut
Fraxinus latifolia	Oregon ash
Lithocarpos densiflorus	Tan oak
Pseudotsuga menziesii	Douglas fir
Pteridium aquilinum pubescens	Bracken fern
Quercus lobata	Valley oak
Quercus guarryana	Oregon white oak
Rosa californica	California rose
Rosa woodsii	Wood rose
Rubus ursinus	California Blackberry
Salix lasiolepis	Arroyo willow
Sambucus mexicana	Blue elderberry
Symphoricarpos albus	Snow berry
Umbellularia californica	Bay laurel
Woodwardia fimbriata	Giant chain fern

Created Seasonal Wetland

Deschampsia caespitosa	Tufted hairgrass
Deschampsia danthonioides	Annual hairgrass
Deschampsia elongata	Slender hairgrass
Hordeum brachyanthereum	Meadow barley
Juncus effuses var. pacificus	Pacific rush
Juncus pattens	Rush

Erosion Control Seeding

Hordeum brachyantherum	Meadow barley
Leymus triticoides	Creeping wild rye
Bromus carinatus	California brome

ZONE VEGETATION:

Species to be identified in final MMP. A minimum of 35 Oak trees will be incorporated within the zones.

Preliminary Drawing Notes:

· Raw stream slopes and transitional areas will be covered in a woven geotextile coir fabric (biodegradable natural material) or equivalent, secured with stakes and seeded with native grasses.

· All plant material for erosion control, stream bank stabilization and habitat restoration will be derived from local site-specific native sources. No non-native plant materials will be used. Only native plant species adapted to specific conditions of each restoration site and with a proven track record in local restoration projects will be used. Small plant container sizes will be emphasized with the exception of use of willow stakes, poles, and mattresses.

· Woody plantings will be maintained for three years after installation. Irrigation (hand watering or above ground temporary drip system) will occur in the first and second year (if necessary due to low rainfall) following plant installation. Weeding and plant protective hardware maintenance will be performed for three years following plant installation. Plant survival monitoring will occur once each year throughout the three year maintenance period. Three annual monitoring reports will be submitted to CDFG, RWQCB, and County of Mendocino.

· All disturbed areas will be seeded with native grasses, applied by hand broadcast seeding or with a hydro-seeding mulch matrix that includes a tackifier to reduce erosion.

REVIEWED BY:

REGISTERED PROFESSIONAL ENGINEER
GEORGE C. RAU
NO. 21908
EXP. 9-30-11
CIVIL
STATE OF CALIFORNIA

DESIGNED BY:

REGISTERED PROFESSIONAL ENGINEER
CATHY A. MCKEON
NO. 51026
EXP. 9-30-11
CIVIL
STATE OF CALIFORNIA

PRELIMINARY

DATE:	REVISION:	BY:

COMPUTER NO:
PATH:
FILE:
PSVIEW:
MSVP:
MSVIEW:

VERIFY SCALE
0 1/2 1 2 3
BAR REPRESENTS THREE INCHES ON ORIGINAL

USE OF THIS DOCUMENT, INCLUDING THE INCORPORATED DESIGNS, IS AN INSTRUMENT OF SERVICE FOR THIS PROJECT AND SHALL NOT BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF RAU AND ASSOCIATES INC.

OWNER: NORTHERN AGGREGATES, INC.
RIDGEWOOD SUMMIT

LOCATION: 16100 N. HIGHWAY 101
WILLITS, CA 95490

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET· (707) 462-6536 UKIAH, CA 95482

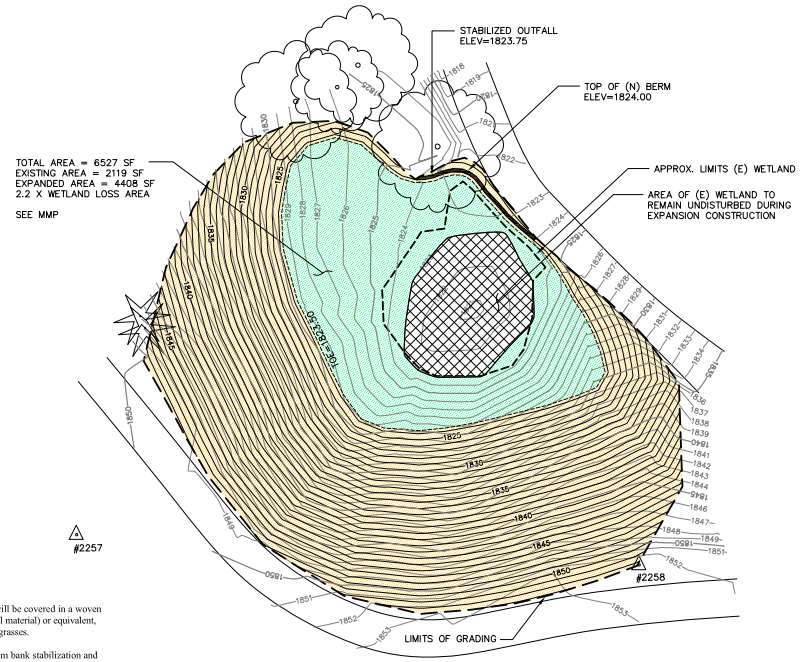
DRAWING: FORSYTHE CREEK RESTORATION
RE-VEGETATION PLAN

PROJECT: HARRIS QUARRY
EXPANSION MITIGATION

Date:	JAN. 2010
Scale:	AS SHOWN
Drawn:	D.R.A.
Checked:	C.A.M.
Reviewed:	G.C.R.
Job No.	R04056

Figure 3-13

VERSION: FOR COUNTY REVIEW ONLY; RECIRCULATED EIR



ZONE 1
(AREA=5.016 ft²)

ZONE 2
(AREA=12,835 ft²)

Harris Quarry Project **Draft Candidate Species List**

Riparian Enhancement Along Forsythe Creek

Scientific Name	*Common Name*
Acer macrophyllum	Big leaf maple
Aesculus californica	California buckeye
Arctostaphylos manzanita	Common manzanita
Baccharis pilularis	Coyote bush
Corylus cornuta	Hazelnut
Fraxinus latifolia	Oregon ash
Lithocarpos densiflorus	Tan oak
Pseudotsuga menziesii	Douglas fir
Pteridium aquilinum pubescens	Bracken fern
Quercus lobata	Valley oak
Quercus guarryana	Oregon white oak
Rosa californica	California rose
Rosa woodsii	Wood rose
Rubus ursinus	California Blackberry
Salix lasiolepis	Arroyo willow
Sambucus mexicana	Blue elderberry
Symphoricarpos albus	Snow berry
Umbellularia californica	Bay laurel
Woodwardia fimbriata	Giant chain fern

Created Seasonal Wetland

Deschampsia caespitosa	Tufted hairgrass
Deschampsia danthonioides	Annual hairgrass
Deschampsia elongata	Slender hairgrass
Hordeum brachyantherum	Meadow barley
Juncus effuses var. pacificus	Pacific rush
Juncus pattens	Rush

Erosion Control Seeding

Hordeum brachyantherum	Meadow barley
Leymus triticoides	Creeping wild rye
Bromus carinatus	California brome

Preliminary Drawing Notes:

· Raw stream slopes and transitional areas will be covered in a woven geotextile coir fabric (biodegradable natural material) or equivalent, secured with stakes and seeded with native grasses.

· All plant material for erosion control, stream bank stabilization and habitat restoration will be derived from local site-specific native sources. No non-native plant materials will be used. Only native plant species adapted to specific conditions of each restoration site and with a proven track record in local restoration projects will be used. Small plant container sizes will be emphasized with the exception of use of willow stakes, poles, and mattresses.

· Woody plantings will be maintained for three years after installation. Irrigation (hand watering or above ground temporary drip system) will occur in the first and second year (if necessary due to low rainfall) following plant installation. Weeding and plant protective hardware maintenance will be performed for three years following plant installation. Plant survival monitoring will occur once each year throughout the three year maintenance period. Three annual monitoring reports will be submitted to CDFG, RWQCB, and County of Mendocino.

· All disturbed areas will be seeded with native grasses, applied by hand broadcast seeding or with a hydro-seeding mulch matrix that includes a tackifier to reduce erosion.

0 20 40
SCALE IN FEET

REVIEWED BY:
REGISTERED PROFESSIONAL ENGINEER
GEORGE C. RAU
NO. 21908
EXP. 9-30-11
CIVIL
STATE OF CALIFORNIA

DESIGNED BY:
REGISTERED PROFESSIONAL ENGINEER
CATHY A. MCKEON
NO. 51026
EXP. 9-30-11
CIVIL
STATE OF CALIFORNIA

PRELIMINARY

VERSION: FOR COUNTY REVIEW ONLY; RECIRCULATED EIR

DATE:	REVISION:	BY:

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PATH:
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MSVP:
MSVIEW:

VERIFY SCALE
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BAR REPRESENTS THREE INCHES ON ORIGINAL

USE OF THIS DOCUMENT, INCLUDING THE INCORPORATED DESIGNS, IS AN INSTRUMENT OF SERVICE FOR THIS PROJECT AND SHALL NOT BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF RAU AND ASSOCIATES INC.

OWNER: NORTHERN AGGREGATES, INC.
RIDGEWOOD SUMMIT

LOCATION: 16100 N. HIGHWAY 101
WILLITS, CA 95490

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET· (707) 462-6536 UKIAH, CA 95482

DRAWING: WETLAND EXPANSION PLAN

PROJECT: HARRIS QUARRY EXPANSION MITIGATION

Date:	JAN. 2010
Scale:	AS SHOWN
Drawn:	D.R.A.
Checked:	C.A.M.
Reviewed:	G.C.R.
Job No.	R04056

Figure 3-14

Due to the constrained site conditions, reestablishment of open channels and maintenance of narrow, deep channels was considered infeasible at the current location. In lieu of this, and as advised by Department of Fish and Game, recommended mitigation will take place off-site on a parcel adjacent to Forsythe Creek, which is also owned by the applicant. Figure 3-10 shows the location of the two proposed wetland and channel mitigation sites.

The proposed mitigation for the stream channel loss includes channel stabilization, enhancement and channel creation for a section of Forsythe Creek. Mitigation here will include planting of willows, oaks and other vegetation on the adjacent terraces to provide connected stands of trees for pool shading. This will include enhancing approximately 26,750 square feet of the creek section. The enhancement also includes incorporation of two minor side channels that will provide overflow for larger storm events. This proposed mitigation is shown on Figures 3-11 through 3-13.

The proposed mitigation for the 0.04-acre wetland loss includes enlargement and enhancement of an existing wetland located downstream of the enhancement area described above. The enhancement will recontour the area to create a larger pooling area for the runoff and incorporate planting on the edge of the existing and in the recontoured area. The enhancement will expand the wetland by about 4,408 square feet. The proposed mitigation is shown on Figure 3-14.

The applicant proposes a number of erosion control BMPs that will be used during construction to control erosion, including revegetation of the new fillslopes and construction of silt fences at the toe of new fillslopes. Any areas where a volume of fuels or other liquid is stored will be double contained. None of the concrete wash water used for project construction will be discharged from the site.

The applicant has prepared a proposed Draft Storm Water Pollution Prevention Program (SWPPP) that describes how hazardous materials and pollutants will be stored and used on the site. The SWPPP describes how water quality will be protected. It includes a methodology for dealing with any leak or spill on the site. A completed SWPPP in accordance with the current NPDES regulations will be supplied to NCRWQCB once the application is approved.

8. Lighting

The process area will have porch lights at the facility's control houses. These two lights will be shielded and downward directed to the immediate area. These two lights will be used as security lights. There will likely be one motion sensor security light at the asphalt facility and the process area fueling station. These lights will be downward directed to the immediate area, approximately 15 feet above the ground; they will only turn on when activated.

The asphalt facility will have approximately 8-10 lights that are used for nighttime operations. These lights will be between 15-30 feet high and will illuminate the immediate area and equipment around them. All the lights will be directed to illuminate this center portion of the Asphalt Plant and not the surrounding environment. There will be no lights mounted in an upward direction, or any that shine directly off the site. The exact location of these lights will be determined once the asphalt plant is purchased and set up. As

described under Subsection 5 above, this lighting could be in operation up to 100 nights per year.

9. Energy Use

The plant's electrical equipment will operate using electricity supplied by PG&E. Since natural gas is not available at the site, the burner at the asphalt facility will be fired with diesel fuel. The diesel for this operation will be fed via double-walled piping directly from the fueling area 20,000-gallon fuel tank. At the 300-TPH rate the burner would consume approximately 400 gallons per hour. Thus, in an 8-hour day a maximum of 3,200 gallons of diesel would be used. This would be the equivalent of less than half a tanker full of fuel.

10. Water Usage

Since the site will be paved, including all the internal roadways, there will be a minimal amount of water needed for dust control. The asphalt plant does not need any water supply for its operations. The water usage for the proposed operation is summarized in Section E(11) above.

11. Wastewater

A new on-site septic system will be constructed in accordance with the Mendocino County Division of Environmental Health's regulations. The leachfield for this septic system will be located approximately 100 feet north of the production well (Well #1) as shown on Figure 3-4.

12. Hazardous Materials

All potentially hazardous materials except fuels and other lubricants contained in trucks and the loader used on site will be stored in double containment tanks or barrels. Hazardous materials include fuels, lubricants, and other fluids used for vehicles (e.g., motor oil, grease, antifreeze, brake fluid, etc.), used oil (200 gallons), asphalt oil (60,000 gallons, of which only 30,000 gallons will be stored at any given time), heating oil (100 gallons), bio-diesel (110 gallons), and diesel (20,000 gallons). The smaller volumes of petroleum products will be in totes or barrels and will be kept in a containment facility in accordance with the Certified Unified Program Agency (CUPA) plan. The asphalt oil will be brought on site on a regular basis as will be described further in the Traffic section of the EIR. One or two trucks per day will likely be required during regular operational periods. Diesel will be brought on-site approximately once per week. The smaller use items as referenced above will be delivered once every two to four weeks.

One 20,000 gallon double-walled tank and hoses/lines will be used for diesel storage. This tank will service all of the major mobile equipment in the process area and fuel the A/C burner. This tank will also be compliant with State regulations for aboveground double-contained fuel tanks. All maintenance fluids will be stored in a central area; primarily these fluids are stored in a lockable storage/maintenance container. All large tanks/barrels (55 gallons or greater) will be housed with sufficient double-containment devices, such as plastic barrel spill containers or concrete containment areas. Additionally this area will be equipped with spill kits containing absorbent pads and granules for quick clean-up of minor

spills. Storage of all hazardous material will be stored and handled in compliance with then current CUPA requirements.

13. Air Quality

Since the roadways will be paved, the use of water to control dust will be reduced. The only unpaved traffic surface will be in the quarry loader/heavy equipment area. The entire site is graded such that no water may run off the site, without first going through at least two pre-treatment processes. These processes will remove silt and sediment through retention basins, and then any potential skim pollutants through gooseneck style overflows.

The asphalt facility contains a baghouse and other equipment to control airborne particles. The asphalt plant is designed to minimize the release of air pollutants and odors, as previously noted in Subsection F-2 above. This will be achieved by recovering any "Blue Smoke" that could escape the process and incinerating it through the burner. The "Blue Smoke" is created by tiny drops of asphalt oil being suspended in the air. The "Blue Smoke" is the source of odor and visible emissions at these sorts of facilities. Containing and destroying it reduces the potential for odors and visible blue haze at the site. This system will effectively create a negative vacuum and suck all the air back through the system.

14. Employees

The asphalt plant will employ 3 new staff at the site and 5 people off-site, including 3 for administration and 1-2 truck drivers. The quarry and asphalt processing site together will have 24-25 employees, of which 12 are on-site and 12-13 are off-site or mobile.

G. Reclamation Plan

The applicant has prepared a draft Reclamation Plan for the quarry and the asphalt processing site, which is on file with the Mendocino County Planning and Building Services Department and summarized below (see Figure 3-15 and Figure 3-16).

The primary reclamation goal is to establish native woody and herbaceous vegetation on re-soiled quarry slopes, benches, floor and processing areas with an end use of open space. A planting palette (i.e., choice of plant species) consisting exclusively of site-specific native plant species will be planted to restore vegetative habitats similar in structure and function to the existing pre-mining habitat and adjacent floristic habitats.

Initial reclamation of the asphalt processing site will begin immediately upon completion of construction at the asphalt processing site. Pilot planting will begin within 5-10 years of the permit approval and be completed 10-20 years after, as grading allows. The Reclamation Plan has an aim to revegetate the upper slope, benches, the floor of the quarry and the entire asphalt processing facility site. The slopes between the quarry benches will be solid rock, and the easterly asphalt processing site cut face will also be rocky. Both slopes would be too steep to revegetate. Therefore, when reclamation is complete 23.0 acres of the 30.6 acres that will be disturbed on the quarry site will be reclaimed with vegetation, and 4.8 of the 5.7 acres disturbed on the asphalt processing

site will be re-vegetated. The end land use for both areas will be open space, that is, land used to support native plants and wildlife.

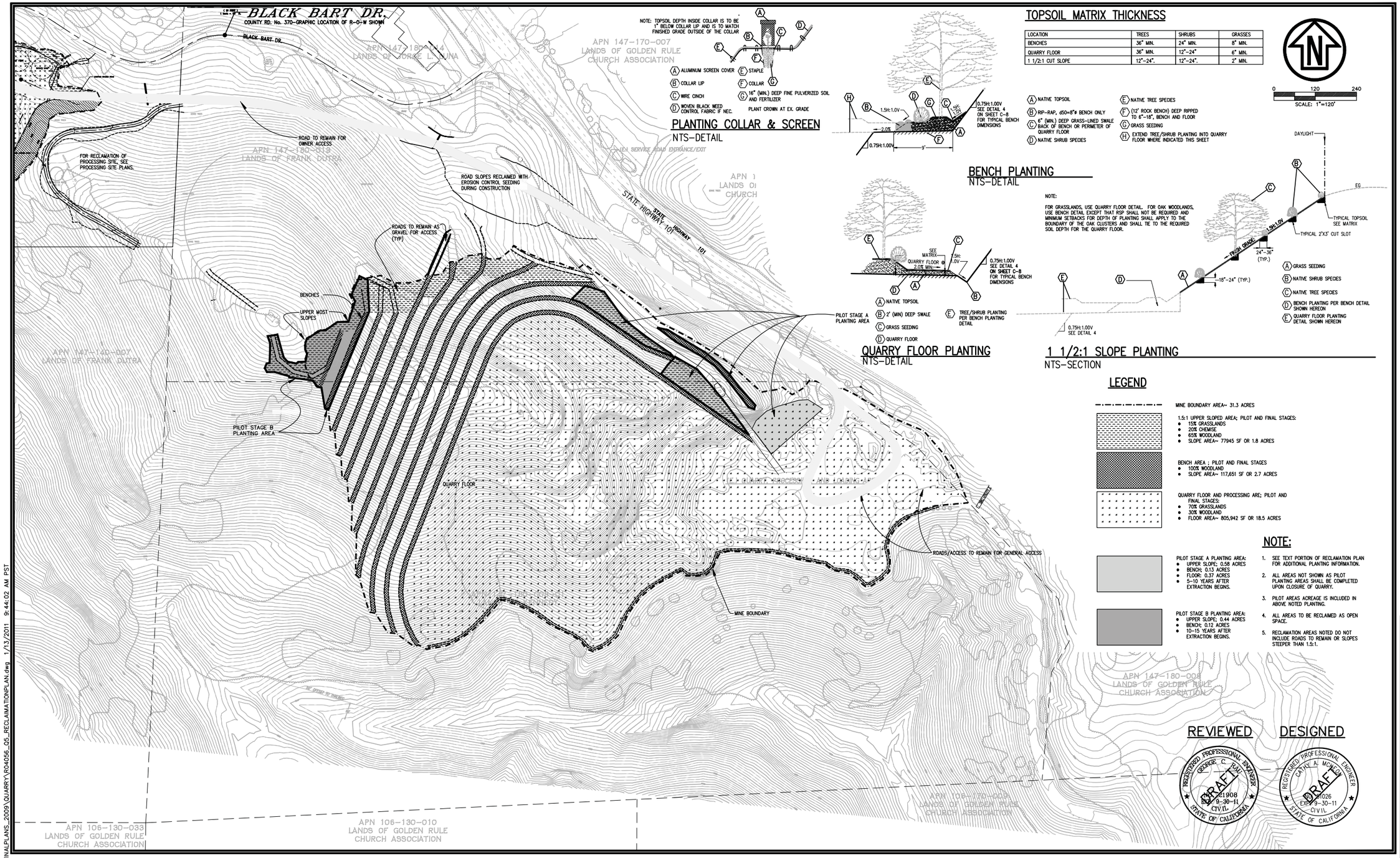
Reclamation is based on an adaptive management approach. The pilot reclamation will be monitored to determine the success of various planting and maintenance techniques. Throughout the reclamation process, the applicant will monitor reclamation success and adjust subsequent reclamation activities to reflect the successes of previous activities.

The applicant must post a bond to complete the Reclamation Plan for the project. If the applicant does not complete implementation of that plan, the County will use the bond to hire another contractor to complete restoration.

Table 3-4 below describes the anticipated schedule for site reclamation.

Table 3-4
Anticipated Phasing for Extraction and Reclamation at Harris Quarry

1. Initial Reclamation Planting & Monitoring	***2011-2018***	
Asphalt Processing Site Construction	**2011-2012**	
Stockpiling Topsoil	2011 (ongoing, during summer)	
Erosion Control Seeding Topsoil Stockpiles	2011 (as disturbed, during fall)	
Grade, Pave, Erect Equipment	2011-2012 (ongoing, during summer)	
Initial Reclamation Planting & Monitoring	***2012-2018***	
Seed Collection and Nursery Propagation	2011-2012	
Resoiling and Site Preparation	2012	
Initial Plot Planting	2012	
Initial Plot Monitoring	2013-2018	
Extraction & Processing 2011-2041		
Stockpiling Topsoil	2011-2031 (ongoing, during summer)	
Erosion Control Seeding Topsoil Stockpiles	2011-2031 (as disturbed, during fall)	
2. *Pilot Reclamation Planting & Monitoring*	***2016-2027***	
	Stage 1A	**Stage 1B**
Pilot Plot Seed Collection and Nursery Propagation	2016-2018	2021-2026
Pilot Plot Resoiling and Site Preparation	2016-2017	2021-2022
Pilot Plot Planting	2019	2023
Pilot Plot Monitoring	2019-2022	2024-2027
3. Final Reclamation & Monitoring	**2035 -2049**	
Seed Collection and Nursery Propagation	2035-2037	
Disassemble Equipment	2042	
Resoiling and Site Preparation	2036-2041	
Planting	2038-2043	
Monitoring	2044-2049	



DATE:	REVISION:	BY:
JAN '11	REVISED OAK PLANTING LEGEND	CAM
NOV. '10	REVISED QUARRY HAUL ROAD, TANK ACCESS ROAD	CAM
AUG. '10	REVISED QUARRY HAUL ROAD, ADD WASH AND MOVE MU TANK	CAM
JAN. '10	REVISED QUARRY FOR SINGLE PHASE, 6,000,000 CY @ 30 YR	CAM
SEPT. '06	CLIENT COMMENT (REVISED HAUL ROAD & CHANNELIZATION)	CAM
NOV. '04	INITIAL SUBMITTAL	MDP

DATUM INFORMATION:
VERTICAL DATA: NVGD 1929
HORIZONTAL DATA: SEE SHEET C–1

BOUNDARY REFERENCE:
RECORD OF SURVEY PREPARED BY THOMAS HERMAN, AUG. 1991, FILED IN CASE 2, DRAWER 54, PAGE 47. MENDOCINO COUNTRY RECORDER'S OFFICE.

TOPOGRAPHICAL SURVEY REFERENCE:
TOPOGRAPHICAL INFORMATION IS BASED ON AN AERIAL SURVEY PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES (JUNE 2004); THIS MAP WAS PREPARED USING COMPUTER ASSISTED, PHOTOGRAMMETRIC METHODS PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES) PHOTOGRAMMETRY IN AREAS OF DENSE VEGETATION MAY BE COMPROMISED AND ACCURACY OF CONTOURS MAY DEVIATE FROM ACCEPTED ACCURACY STANDARDS.

CLIENT & OPERATOR:
NORTHERN AGGREGATES, INC.

PROJECT LOCATION:
(EXISTING) HARRIS QUARRY OPERATION @ RIDGEWOOD GRADE
APN: 147–180–008
MENDOCINO COUNTY, CALIFORNIA

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS • LAND SURVEYORS
100 NORTH PINE STREET • (707) 462–6536 • UKIAH, CA 95482

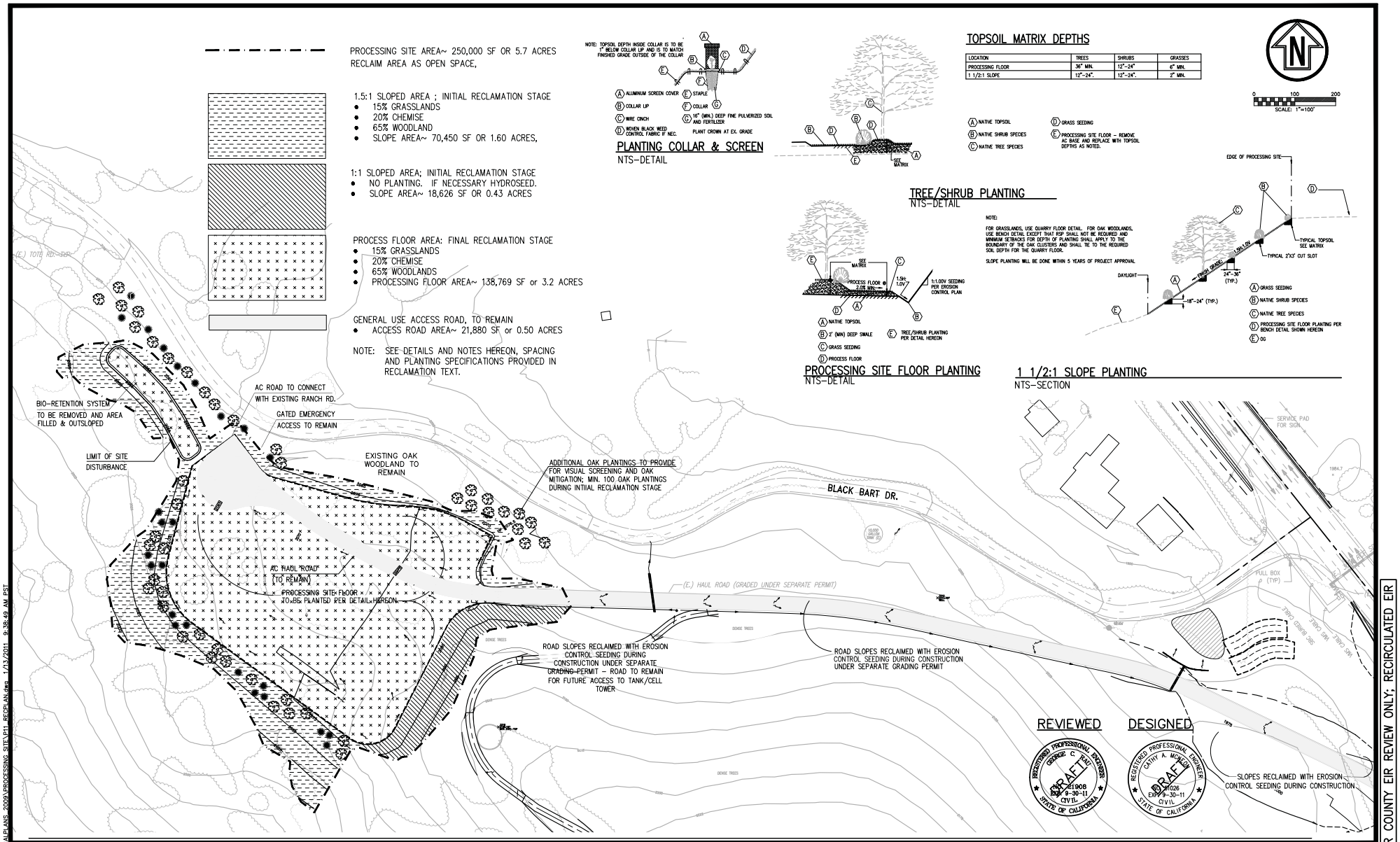
DRAWING:
DRAFT RECLAMATION PLAN–QUARRY

Date: DECEMBER 2004
Scale: 1"=120'
Design/Drawn: MDP
Checked: MDP/CAM
Reviewed: GCR
JOB NO. R04056

Figure 3-15

VERSION: FOR COUNTY REVIEW ONLY; RECIRCULATED EIR

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DATE:	REVISION:	BY:
JAN. '11	REVISED RECLAMATION PLANTING	CAM
NOV. '10	REVISED FOR AC PLANT, TANK AND HAUL ROAD	CAM
JAN. '10	REVISED FOR SINGLE PHASE, 6,000,000 CY AT 30 YR.	CAM
SEPT. '08	CLIENT COMMENTS (REVISED HAUL ROAD)	CAM
AUG. '05	CLIENT COMMENTS (ROTATED PPC AND AC PLANTS)	MDP
MARCH '05	INITIAL SUBMITTAL	MDP

DATUM INFORMATION:
VERTICAL DATA: NVGD 1929 HORIZONTAL DATA: SEE SHEET P-1
BOUNDARY REFERENCE: RECORD OF SURVEY PREPARED BY THOMAS HERMAN, AUG. 1991, FILED IN CASE 2, DRAWER 54, PAGE 47, MENDOCINO COUNTRY RECORDER'S OFFICE
TOPOGRAPHICAL SURVEY REFERENCE: TOPOGRAPHIC INFORMATION IS BASED ON AN AERIAL SURVEY PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES (JUNE 2004); THIS MAP WAS PREPARED USING COMPUTER ASSISTED, PHOTOGRAMMETRIC METHODS PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES) PHOTOGRAMMETRY IN AREAS OF DENSE VEGETATION MAY BE COMPROMISED AND ACCURACY OF CONTOURS MAY DEVIATE FROM ACCEPTED ACCURACY STANDARDS.

CLIENT & OPERATOR:
NORTHERN AGGREGATES, INC.
PROJECT LOCATION:
PROPOSED PROCESSING FACILITY
APN: 147-140-07 & 147-180-013
MENDOCINO COUNTY, CALIFORNIA

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS • LAND SURVEYORS
100 NORTH PINE STREET • (707) 462-6536 • UKIAH, CA 95482

DRAWING:
DRAFT RECLAMATION PLAN-
PROCESSING SITE

Date: MARCH 2005
Scale: AS SHOWN
Design/Drawn: MDP
Checked: CLIENT/MDP
Reviewed: CCR
JOB NO. R04056.0

Figure 3-16

VERSION: FOR COUNTY EIR REVIEW ONLY; RECIRCULATED EIR

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1. Initial Reclamation Stage

The Initial Stage of reclamation is to reclaim all slopes that are 1.5:1 or flatter surrounding the asphalt processing area, which includes 1.6 acres. This reclamation will aid in providing visual screening from Black Bart Drive as well as to stabilize the slopes, and it will also assist in evaluating the success of the Final Reclamation phase. The slopes will be reclaimed in accordance with the planting scheme noted in the following sections. The location of the Initial reclamation areas are shown on Figure 3-16.

2. Pilot Reclamation Stage

The Pilot Stage is a two-stage reclamation of a total 1.62-acre area that includes a 0.25-acre bench, 1.0-acre of sloped area, and a 0.37-acre area of the quarry floor. The pilot areas, or test plots, are staggered to accommodate the quarry grading and various planting vegetation series and will span a period between 5 years after project approval to 15 years after project approval. This time frame is dependent on market demand and may be lengthened to allow for grading at a slower rate. The location of the pilot reclamation areas are shown on Figure 3-15. The pilot reclamation is designed to test the vegetation response and cost-effectiveness of the different revegetation techniques and types proposed. The pilot reclamation will be subdivided into sub-plots representing five vegetation series: mixed oak, tanoak, chamise, canyon live oak shrub, and grassland series that are vegetation types that currently exist in the proposed quarry area and one additional habitat of mixed oak woodland that will achieve this primary reclamation goal. The habitat of mixed oak woodland has been added to supplement the oak plantings. The pilot reclamation areas will employ the planting, maintenance, and monitoring methodologies for three planting configurations (i.e., the slope, the floors and the benches) described in this plan.

Pilot planting monitoring data will also be used to:

- identify the individual plant species and plant species assemblages that exhibit the highest survival rates and revise species composition strategies accordingly;
- identify plant species and assemblages that are subject to the greatest level of animal browse and develop recommendations for supplemental protective measures;
- assess the sufficiency of the specified volume of irrigation and revise irrigation recommendations;
- assess the sufficiency of maintenance activities and revise as needed; and
- identify plant species unable to survive under the same irrigation regime as the majority of other plants, and they may be substituted for with more drought tolerant species.

The 1.62-acre pilot reclamation site will be graded as shown on the grading plan and divided into two stages, Stage A and Stage B, to accommodate the grading sequence throughout the life of the quarry. Phase A will be more representative of the lower benches, slopes, and floor. Stage B will be representative of the upper benches and

slopes. The location of the pilot planting was selected to reflect the harsher environments that will typically be experienced on the quarry reclamation areas and in areas that are feasible for grading within the timeframes noted. The slope surface is expected to be composed of shallow native soil and exposed subsoil with softer fragmented rock and some hard rock outcrops.

3. Final Reclamation Stage

The Final Reclamation Stage will incorporate the most efficient and effective methods of planting determined from the pilot and initial planting stage. At the end of the pilot planting period a summary report will be submitted to OMR to document the findings and recommendations.

a. Bench Reclamation

The interior 9 feet of the remaining benches, totaling 2.45 acres, will be reclaimed in the same manner as that determined to be most effective in the pilot stage.

b. Slope Reclamation

The remaining upper slope areas, totaling 0.83 acres, will be reclaimed in the same manner as that determined to be most effective in the pilot stage.

c. Quarry Floor and Quarry Processing Area Reclamation

The remaining quarry floor and processing areas, totaling 18.1 acres, will be reclaimed in the same manner as that determined to be most effective in the pilot stage.

d. Asphalt Processing Area Floor and Basin

The entire asphalt processing floor and basin areas, totaling 3.2 acres, will be reclaimed in the same manner as that determined to be most effective in the pilot stage, except that floor planting will follow the detail for floor planting, not slope planting on Figure 3-16.

4. Reclamation Specifications

The goal of the planting is to achieve a mix of vegetation that is similar to the existing vegetation series and will also accomplish the mitigation requirements for the oak woodlands loss. The species composition and canopy cover goal for each species within each vegetation series is represented in Tables 3-5 and 3-6. The grasslands species planting are included in the text of the Reclamation Plan.

a. Bench Reclamation

The interior 9 feet of the quarry benches will be deep ripped (i.e., the soil is loosened by a bulldozer pulling a device that loosens or "rips" the underlying subsoil and road). Topsoil that has been removed and stored will be spread on the quarry benches. Soil amendments will either be added to the topsoil or to the planting hole backfill. There will not be enough stored topsoil to meet SMARA reclamation requirements, and the topsoils will need to be supplemented with purchased amendments, off-site topsoil, and/or fine

material from quarry operations. As warranted, mycorrhizal inoculants and fertilizers will be applied. The slopes between the benches are too steep to be reclaimed and will be left unvegetated, except to the degree that they naturally revegetate over time.

Trees, shrubs, grasses, and forbs will be planted on the upper benches. Seeds and propagules will be seeds or propagules taken from plants on the site or in the nearby area. The species to be planted are typical of the four plant communities present on the site (tanoak, chamise, canyon live oak, and grassland series). The final species palette will be determined after assessing the success of plantings in the pilot reclamation plot. Trees will be planted at an average spacing of 14-feet on center triangular spacing and shrubs will be planted on an average 11-feet spacing. This will result in about 250 planted trees and shrubs per acre. At this time, trees to be planted include the tanoak series listed in Table 3-5 (substituting coyote brush for red huckleberry) and the canyon live oak scrub series, including canyon live oak, Oregon white oak, California bay, buckeye, toyon, coyote brush, and deer brush. Plants will be mulched, irrigated, and protected from browse.

b. Upper Quarry and Processing Slopes Reclamation

The goal of reclamation on the upper quarry and asphalt processing site slopes that are 1.5:1 is to restore a mosaic of self-sustaining native oak woodland, chamise chaparral, and grassland habitats of a similar diversity and density as the existing habitat. Reclamation of the slope area will be accomplished via active revegetation of woody plant species, hydroseeding of herbaceous species, placement of coarse woody debris, and control of invasive exotic plant species. The goal of reclamation in the slope area is to create planting pockets, deposit topsoil to create a seedbed, and establish 65% mixed oak woodland (2.3 acres), 20% chamise habitat (0.7 acres), and 15% grasslands (0.5 acre). Initially there will be more grassland habitat, which is expected to shrink in the long term as increasing woody plant canopies shade out understory grasses. The entire upper slope area will be hydroseeded to establish immediate vegetative cover while the woody vegetation is being planted.

Stockpiled and/or commercially acquired topsoil will be spread throughout the upper slope area to a depth of approximately 2 inches to provide a seed bed for hydroseeding. Soil amendments will either be placed in the bottom of the planting hole or blended with native soil removed from the planting hole in the amounts described per the soil amendment sub-section presented in the full plan. The amended soil backfill will be lightly compacted to remove air spaces between roots and soil. Plants will be irrigated, protected from deer browse, and mulched.

c. Quarry Floor and Quarry Processing Site

Reclamation of the quarry floor will begin about the same time that mining is completed. The quarry floor is located in bedrock so no additional topsoil or coarse woody debris is expected to be salvaged for subsequent reuse during this stage. If the final quarry floor consists of unfractured bedrock, the surface will be scarified or overblasted prior to placement of imported topsoil/overburden.

The 18.5-acre quarry floor and processing area will be reclaimed as a mix of 70% grasslands and oak woodlands. This area will be finish graded following the dismantling of

operations apparatus at the end of aggregate extraction. The process area at the quarry will not be benched and quarried. Similar to the upper slope, the soil surface is expected to be composed of shallow native soil and exposed subsoil overlain in areas with gravel. The goal of reclamation in the quarry processing area is to decompact the soil as needed, spread topsoil to create a seedbed, and establish 70% (13.0 acres) grasslands, 20% (3.7 acres) canyon oak woodland, and 10% tanoak woodland habitat (1.8 acres).

d. Asphalt Processing Facility Floor and Basin

The asphalt processing site reclamation is shown on Figure 3-16. The slopes that are 1.5:1, comprising 1.6 acres, will be reclaimed in the same manner as the upper slopes on the quarry except that the planting detail is that shown for floor planting. The goal of reclamation in the processing floor area is to decompact the soil as needed, spread topsoil to create a seedbed, and establish 15% grassland habitat (0.5 acre), 65% mixed oak woodland habitat (2.0 acre), and 20% chemise habitat (0.6 acre), similar to the slope planting. The mixed oak woodlands habitat was dominant to enhance the plantings of oak to mitigate the loss of oak woodlands. The asphalt processing site floor reclamation will occur during the Final Reclamation Stage and be vegetated in accordance with the same plantings as the slopes, but in accordance with the floor details shown in the plans.

5. Maintenance Plan

As described in detail in Appendix A of the full draft Reclamation Plan, trees and shrubs will be protected from browse, and invasive non-native plants like yellow star thistle will be eradicated. The draft Reclamation Plan includes a monitoring component that includes performance and success criteria.

The success of reclamation will be evaluated based on the quantitative performance and success criteria summarized below. Performance criteria are interim standards or project milestones that should be achieved for the project to meet the final success criteria that it must achieve.

a. Tree and Shrub Plantings

- Year 1 Performance Standard: At the end of the Year 1, 80% overall combined tree and shrub survival with a minimum of 40% survival of each individual plant species, and a health and vigor rating of 2 averaged across all species.

- Year 3 Performance Standard: At the end of the Year 3, 65% overall combined tree and shrub survival with a minimum of 30% survival of each individual plant species, and a health and vigor rating of 2.5 averaged across all species.

- Year 5 Success Standard: At the end of the Year 5, 50% overall combined tree and shrub survival with a minimum of 25% survival of each individual plant species, and a health and vigor rating of 3 averaged across all species. If the final success standards are met by Year 5 following two years without human intervention, further monitoring is not required.

Table 3-5

Recommended Plant Installation Specification for Upper Quarry Slope and Asphalt Processing Site Reclamation Areas

(Planting Area: Upper Quarry slope 1.8 acres; Asphalt Processing Site Reclamation Area 4.8 acres)[21].

Layer	Common Name	Scientific Name	% Canopy Cover Goal for Series	On-Center Spacing (ft.)	Planting Position	Propagule or Container Size
Mixed Oak Woodland Vegetation Series - Cover Goal for Planting Area:						
65% Upper Quarry Slopes (1.2 Acres); 65% Asphalt Processing Site Area (3.1 Acres)						
Over-story	Tanoak	*Lithocarpus densiflorus*	5	14	northeastern portion of slope near drip lines of existing trees in groups of 3-5	Super Cell /Tree Pots
	Oregon White Oak	*Lithocarpus garryana*	40	14	same as above, groups of 3-5	Super Cell /Tree Pots
	Madrone	*Arbutus menziesii*	5	14	same as above, groups of 2-3	Super Cell /Tree Pots
	Canyon Live Oak	*Quercus Chrysolepis*	20	14	same as above, groups of 2-3	Super Cell /Tree Pots
Midstory	Interior live oak	*Quercus wislizenii*	15	14	northeastern portion of slope further away from existing trees in groups of 3-5	Super Cell /Tree Pots
	Black oak	*Quercus kelloggii*	5	14	same as above	Super Cell /Tree Pots
Shrub Layer	Red huckleberry	*Vaccinium parvifolium*	10	8-14	Throughout northeastern portion of slope between tree in clusters of 5-10	Super cell /D-pot
Chamise Chaparral Vegetation Series - Cover Goal for Planting Area:						
20% Upper Quarry Slopes (0.4 Acres); 20% Asphalt Processing Site Area (1.0 Acres)						
Tall	Chamise	*Adenostoma fasciculatum*	60	8-14	Throughout southeastern portion of the slope in clusters of 10-15	Super cell /D-pot
	Mountain mahogany	*Cercocarpus betuloides*	5	8-14	same as above	Super cell /D-pot
	Manzanita	*Arctostaphylos manzanita*	15	8k-14	same as above	Super cell /D-pot
	Deer brush	*Ceanothus integerrimus*	10	8-14	same as above	Super cell /D-pot
Short	Buck brush	*Ceanothus cuneatus*	10	8-14	same as above	Super cell /D-pot
	Monkey flower	*Mimulus aurianticus*	(5)	8-14	same as above	hydroseed
	Buckwheat	*Eriogonum luteolum*	(10)	8-14	same as above	hydroseed
Grasslands - Cover Goal for Planting Area:						
15% Upper Quarry Slopes (0.2 Acres); 15% Asphalt Processing Site Area (0.7 Acres)						

[21] This area does not include slopes steeper than 1.5:1, roads to remain or haul road slopes stabilized with erosion control seeding.

Table 3-6
Recommended Plant Installation Specification for Benches and Quarry Floor Reclamation Areas
(Planting Areas; Benches 2.7 acres; Quarry Floor 18.5 Acres)21

Common Name	Scientific Name	% Canopy Cover Goal	On Center Spacing(ft.)	Planting Position	Propagule or Container Size
Tanoak Woodland Vegetation Series : Cover Goals for Planting Area – 40% Benches (1.1 Acre); 10% Quarry Floor (1.8 acre)					
Tanoak	*Lithocarpus densiflorus*	25	14	Throughout benches but favoring northern portion near existing tanoaks, plant in groups of 5-7 on second step	Super Cell /Tree Pots
Madrone	*Arbutus menziesii*	20	14	same as above, groups of 3-5	Super Cell /Tree Pots
Douglas fir	*Pseudotsuga menziesii*	25	14	same as above, groups of 2-3	Super Cell /Tree Pots
Interior live oak	*Quercus wislizenii*	5	14	Same as above, groups of 3-5 on first bench	Super Cell /Tree Pots
Black oak	*Quercus kelloggii*	5	14	same as above	Super Cell /Tree Pots
Substitute* coyote brush	*Baccharis pilularis*	20	8-14	same as above in clusters of 5-10 on first bench	Super cell /D-pot
Canyon Live Oak Scrub Vegetation Series: Cover Goals for Planting Area – 60% Benches (1.6 Acre); 20% Quarry Floor (3.7 Acres)					
Canyon live oak	*Quercus chrysolepis*	20	8-14	Throughout benches but favoring western portion near existing CLO habitat, plant in groups of 3-5 on second step	Super cell /D-pot
Oregon white oak	*Quercus garryana*	15	8-14	same as above	Super cell /D-pot
California bay	*Umbellularia californica*	20	8-14	same as above	Super cell /Tree-pot
Buckeye	*Aesculus californica*	10	8-14	same as above	Super cell /Tree-pot
Coyote brush	*Baccharis pilularis*	10	8-14	same as above, plant in groups of 5-7 on first step	Super cell /D-pot
Toyon	*Heteromeles arbutifolia*	10	8-14	same as above	Super cell /D-pot
deer brush	*Ceanothus integerrimus*	15	8-14	same as above	Super cell /D-pot
Grasslands: Cover Goals for Planting Area – 70% Quarry Floor (13.0 acres					

b. Hydroseeded Grasslands

Year 1 Performance Standard: In Year 1 there will be 50% vegetation cover of reclaimed grassland, either by the grass, forb, and shrub species in the hydroseed mix or by naturally recruited native or naturalized grasses and forbs occurring in the reference grassland site.

- Year 2 Success Standard: In Year 2 there will be 65% vegetative cover in the grassland habitat with the plant types described above. If the final success standard is met by Year 2 following one year without human intervention, further monitoring is not required.

- There are no performance and success criteria for broadcast seeded areas because herbaceous cover is intended for topsoil stability and grassland habitats are not the intended climax community.

c. Tree and Shrub Planting Remedial Measures

The Reclamation Plan requires remedial actions if the monitoring indicates unsatisfactory reclamation. These measures are outlined below.

- If the percent survival falls below 80% in Year 1 and below 65% in Year 3, then all dead trees and shrubs will be replaced via container planting or direct seeding of acorns and/or buckeyes. The most robust plant species exhibiting high survivorship would be utilized to replace the dead individuals. Adaptive management measures to increase survival could include, additional plant protection hardware, deeper irrigation basins, more frequent irrigation, an increase in weeding, mulch or soil amendment, and so on. If woody plant survival is just slightly under the success standard, then naturally recruited woody plants would be protected and counted.

- If success criteria are not met in five years, then the reclamation methods will be re-evaluated and more intensive approaches will be developed and implemented with the prior approval of the County and the State Department of Conservation.

d. Hydroseeding and Broadcast Seeding Remedial Measures

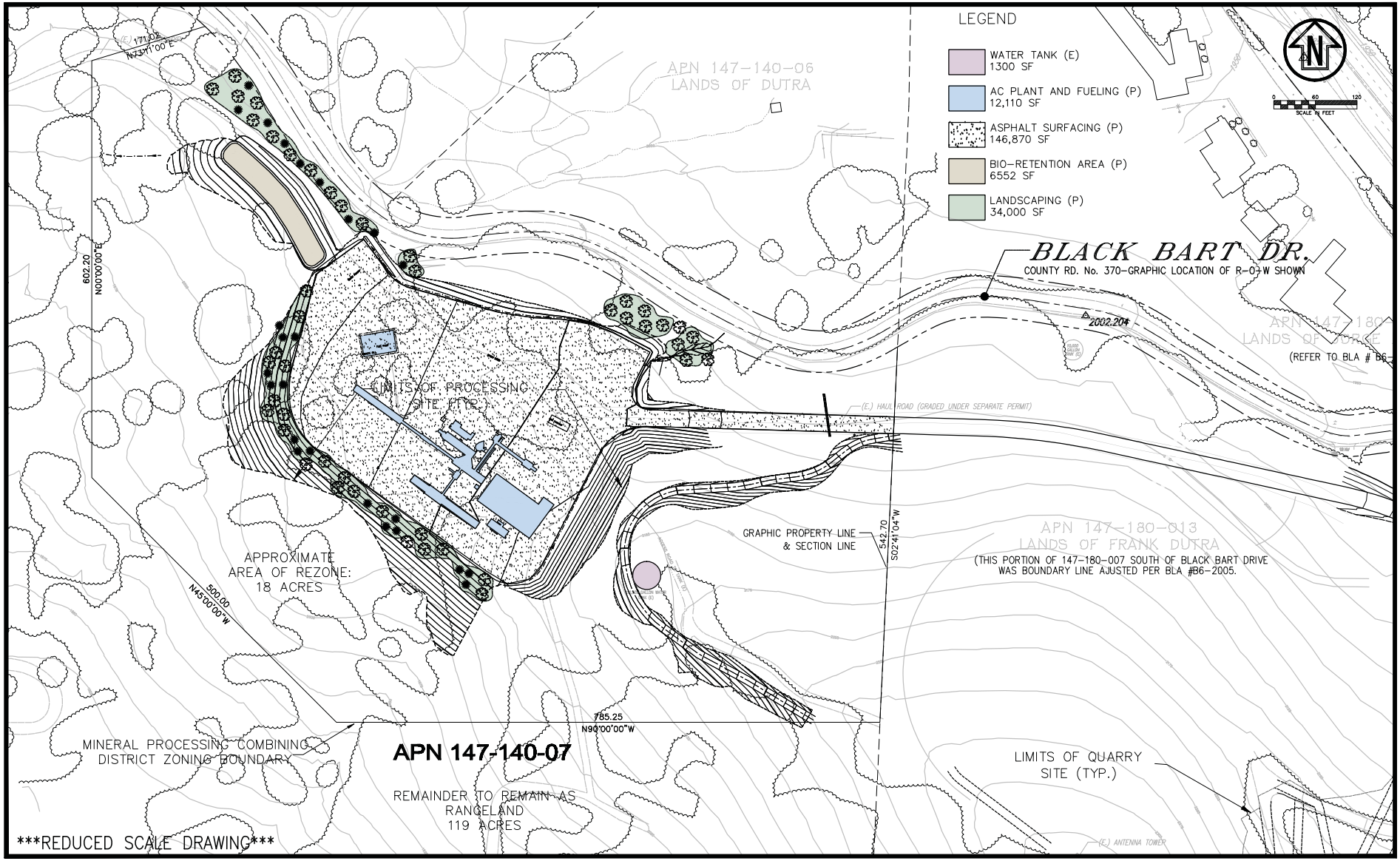
If the percent coverage is less than 50% coverage in Year 1, then additional soil preparation and resowing of seed in bare areas by the hand and rake method will be employed. If the cover is still less than 65% in Year 2, then adaptive management measures, including additional soil placement, “rain for rent“ irrigation, direct transplant of grass plugs, and substitute species will be considered

G. New Zoning District

The Mendocino County Zoning Ordinance does not allow mineral processing in the Rangeland zoning district. Currently, asphalt and concrete plants are allowed only in Industrial zones or for temporary periods for specific projects. The applicant has proposed a new Mineral Processing Combining District that could apply to properties with mineral resources that are zoned Rangeland (the specific language proposed for

the new district is included in Appendix A). This new district would establish a height limit of 75 feet for asphalt silos and other mineral processing equipment. Such processing facilities would be allowed only within 0.5 miles of a mine with vested rights or a County permit allowing mining. Any future applicant who wished to have his/her mining property rezoned to have this combining district would need approval by the County Board of Supervisors. This would be a discretionary approval that would require CEQA review. The County would have the authority to not approve the rezoning if it would result in unacceptable environmental impacts. Once the mineral processing activities are no longer permitted, the applicant is required to submit an application to remove the overlay district zoning. It is the intent of the proposed zoning ordinance to link the mineral processing to active mining of a mine site, but it does require discretionary action by the board to rezone the parcel back to its former zoning.

The applicant proposes to rezone 18 acres of Assessor's Parcel No. 147-140-07 to this Mineral Processing Combining District. The area includes the site of the asphalt processing facility and is shown on Figure 3-17. The applicant is willing to accept a Condition of Approval requiring them to submit an application having the MP Combining District removed from the project site at the end of the 30-year Use Permit.



DATE:	REVISION:	BY:
FEB. 2011	REVISE PROCESSING EQUIPMENT, FUELING, TANK ACCESS RD.	CAM
FEB. 2010	REVISE PROCESSING SITE FLOOR AND PLANTING	CAM
FEB. 2008	INITIAL SUBMITTAL	MDP

DATUM INFORMATION:
VERTICAL DATA: NVGD 1929 HORIZONTAL DATA: SEE SHEET C-1

BOUNDARY REFERENCE:
RECORD OF SURVEY PREPARED BY THOMAS HERMAN, AUG. 1991, FILED IN CASE 2, DRAWER 54, PAGE 47 MENDOCINO COUNTRY RECORDER'S OFFICE

TOPOGRAPHICAL SURVEY REFERENCE:
TOPOGRAPHICAL INFORMATION IS BASED ON AN AERIAL SURVEY PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES (JUNE 2004). THIS MAP WAS PREPARED USING COMPUTER ASSISTED, PHOTOGRAMMETRIC METHODS PROVIDED BY POINT PHOTOGRAMMETRIC SERVICES) PHOTOGRAMMETRY IN AREAS OF DENSE VEGETATION MAY BE COMPROMISED AND ACCURACY OF CONTOURS MAY DEVIATE FROM ACCEPTED ACCURACY STANDARDS.

CLIENT & OPERATOR:
NORTHERN AGGREGATES, INC.

PROJECT LOCATION:
(EXISTING) HARRIS QUARRY OPERATION @ RIDGEWOOD GRADE
APN: 147-180-008
MENDOCINO COUNTY, CALIFORNIA

RAU AND ASSOCIATES INC.
CIVIL ENGINEERS · LAND SURVEYORS
100 NORTH PINE STREET · (707) 462-6536 · UKIAH, CA 95482

DRAWING:
MINERAL PROCESSING COMBINING ZONING BOUNDARY EXHIBIT B

Date:
Scale: AS SHOWN
Design/Drawn: MDP
Checked: MDP/CAM
Reviewed: GCR
JOB NO. R04056

Figure 3-17

VERSION: FOR COUNTY REVIEW ONLY; RECIRCULATED EIR

Chapter 4.0

Environmental Impact Analysis

4.0 ENVIRONMENTAL IMPACT ANALYSIS CHAPTER

A. Format of the Analyses

This section of the EIR addresses in detail the interaction of the proposed project with its natural environment. Each area or topic of environmental concern that is addressed in this EIR is discussed using the following format:

1. Setting

This section includes a description of the existing physical and environmental conditions (i.e., the baseline conditions) as regards the particular environmental factor under consideration (per *CEQA Guidelines* Section 15125).

For purposes of this EIR, the baseline conditions include extraction of 75,000 cubic yard (CY) *in situ* per year from the project site. After crushing and processing, this rock equals 93,000 CY per year of saleable aggregate.[22]

Several commenters on the original EIR opined that the EIR did not contain sufficient discussion of baseline conditions to allow readers to understand project impacts. That original EIR and this revised Draft EIR do contain substantial information on baseline conditions. It is to be remembered that the CEQA Guidelines Section 15141 states that an EIR should normally be less than 150 pages while unusually complex projects should normally be less than 300 pages. The original Draft EIR was 361 pages plus appendices. The purpose for recommending limitations on the number of pages is so that the document is so long that it discourages the lay reader from reading it. CEQA Guidelines Section 15151 states that:

> *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 environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible.*

2. Potential Impacts and Mitigations

This section begins with a list of the criteria that are used to determine impact significance. The criteria are based on the list of impacts typically considered significant as listed in the *CEQA Guidelines*. This section then describes the possible significant impacts (per *CEQA Guidelines* Section 15126a and b).

Each impact is identified, described, and assessed. Following the discussion of each potentially significant impact is a listing of possible mitigation measures for that impact. CEQA requires mitigations only for impacts deemed significant. Nevertheless, this EIR occasionally does recommend additional mitigations even if the identified impact is not necessarily significant. Mitigations that include the words "shall," "will," or "must" are

[22] This is based on a County-accepted conversion factor of 1 CY of rock in situ equaling 1.24 CY of saleable aggregate.

necessary to adequately mitigate potentially significant impacts. Mitigations using the words "should," "would," or “may” are recommended to further reduce the level of impact, but are not necessary to reduce the identified impacts to a level below significance. Finally, there is a determination of whether the impact is significant if the mitigations are required.

3. Cumulative Impacts

The EIR includes an analysis of potentially significant cumulative impacts. CEQA defines a cumulative impact as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative impact 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” (*CEQA Guidelines* Section 15355). If the EIR determines the project’s contribution to the impact is not “cumulatively considerable,” then the impact is not considered significant.

Typically, a cumulative impact analysis is based either on: 1) the project plus a list of other approved but not constructed projects, projects for which there is an application filed, and other reasonably foreseeable projects, or 2) on projections included in some type of approved plan. In the case of this project, there are no other proposed projects in the area (i.e., Forsythe Creek watershed or the area served by Black Bart Drive), and assessing the impacts of this unique type of project per plan projections of growth is not useful.

The applicant has stated in the Project Description that it has no intent of mining the site after 30 years and has volunteered to have the MP Combining District removed from the property so the property would remain Rangeland at the end of the 30-year Use Permit. However, because the applicant originally filed for a larger project on the site, and the applicant estimates that there will be 12,270,000 CY of aggregate remaining on the quarry site after the 30-year permit has ended, the County has determined that future mining of the site remains a “reasonably foreseeable project.” Future quarrying of this known source of aggregate by some party is a foreseeable project. The County has directed that the cumulative impact analysis in this EIR assumes that future expansion would have approximately the same footprint as assessed in the original DEIR. This EIR assesses the long-term (after the 30-year Use Permit expires) impacts of the project as proposed plus development of the larger quarry footprint as it was identified and assessed in the original Draft EIR.

Where the analysis is pertinent, this EIR also assesses whether the project’s impacts added to past development of the quarry result in any new or more significant cumulative impacts.

To assess impacts that could have a regional effect, growth projections were used. Cumulative traffic impacts were assessed based on Caltrans growth projections for Highway 101 plus construction of the Willits Bypass. A cumulative noise analysis and air quality analysis were also done using this long-term traffic scenario to determine long-term noise and air quality impacts along Highway 101.

4. Mitigation Monitoring and Reporting Program

CEQA requires that prior to project approval, the County approve what is called a Mitigation Monitoring and Reporting Program (MMRP). This program describes who will be responsible for implementing the final mitigations required for the project and who will ensure that the implementation was completed as described. The program also explains when implementation and verification will be done. The MMRP is typically included as part of the Final EIR so that it captures the final mitigation measures, and that is the case for this project. The Final EIR will contain the MMRP that explains who will do the recommended mitigation measures and when.

4.1 GEOLOGY AND SOILS

A. Setting

1. Introduction

The following section summarizes the geology, soils, and seismicity of the Harris Quarry project area. Included is a discussion of existing conditions and the constraints to quarrying posed by site geologic, soils, and seismic conditions. Certain conditions, such as weak or erosive soils, may be practically mitigated through suitable grading, geotechnical engineering, engineering geologic, drainage controls, and other measures. However, the unpredictable nature of some geologic hazards, such as strong or violent seismic shaking from an earthquake, may only be mitigated to an acceptable standard or level of risk. The geology and soils in the Mendocino County area are mainly a consequence of the long history of active tectonics near the margin between the Pacific and North American Tectonic Plates, patterns of climate change, and changing land use and vegetation patterns. Typical geologic and soils related impacts on quarry activities within Mendocino County include strong seismic shaking; slope instability that may cause landslides, debris flows, and other types of slope failure; and basic soil instability, including settlement, shrinking and swelling of expansive soil, and fissuring or cracking of the ground. These constraints are interrelated and may be exacerbated by periodic heavy rains causing soil erosion, saturation of the ground, and flooding.

The analysis was prepared based on: (1) Engineering Geology and Geohazards Report for Harris Quarry, Mendocino County, California, Blackburn Consulting, Inc. (BCI), December, 2004; (2) Final Grading, Reclamation, and Erosion Control Plans for Earth Products Removal at Harris Quarry, Rau and Associates, Inc., December 2004 (latest revision January 2010); (3) Amended Reclamation Plans for Harris Quarry Expansion, Mendocino County, California, by Rau and Associates, Inc. of Ukiah, California, prepared January 2005, amended through January 2011; (4) Geotechnical Report of Service Road and Water Storage Tank, BCI, August 2005; (5) Geotechnical Report on Processing Facilities Pad, BCI, September 2005; (6) Slope Stability Analysis for Harris Quarry Final Face, BCI, October 2006; (7) Cut Slope Evaluation for Harris Quarry Haul Road (BCI) February 2007 (with addendum dated July 2008); (8) Proposed Cut-Slope for Harris Quarry Processing Facilities, December 2009 (BCI); (9) California Probabilistic Seismic Hazards Assessment, California Geological Survey, 2002, amended April 2003; (10) a review of regional geologic and seismic data for the area; (11) review of the potential effects of existing geologic hazards on proposed facilities; and (12) analysis of the potential for new hazards to develop due to the proposed expansion of the quarry.

This section of the EIR describes the geologic conditions of the Harris Quarry project area and the potential adverse impacts to the facility infrastructure and local residents in regard to geologic hazards and conditions, along with appropriate mitigations to address identified significant or potentially significant impacts.

2. Regional Geologic and Seismic Setting

Harris Quarry is located approximately four miles south of the town of Willits within the Coast Range Geomorphic Province of Northern California. The Coast Range is a

geologically complex and seismically active region characterized by a series of northwest-southeast trending mountain ranges with ridges and valleys that roughly parallel the Pacific coast. The Franciscan Complex of Jurassic-Cretaceous age and the Great Valley sequence of Cretaceous age are the oldest bedrock units in the province. Subsequently, younger rocks such as the Tertiary-age Sonoma Volcanics, the Plio-Pleistocene age Clear Lake Volcanics and numerous sedimentary rocks were deposited throughout the province. Extensive folding and thrust faulting during late Cretaceous through early Tertiary time created the complex geologic conditions that underlie the highly varied topography today. The city of Willits is located within the Little Lake Valley, a north-south trending structural depression that roughly follows the Maacama fault zone. The project site is located to the south of this valley.

The Coast Range Geomorphic Province formed along the boundary between the North American and Pacific Crustal Plates. The contact between these two plates is currently the San Andreas Fault 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, Maacama, and Bartlett Springs faults, with movement of the Pacific Plate to the north and west relative to the North American Plate.

The regional geology consists of complexly folded, faulted, sheared and altered bedrock. The bedrock of the region is the Franciscan Complex of Upper Jurassic to Cretaceous age (65 to 190 million years old). The Franciscan Complex is comprised of a variety of rock types, predominately sandstone, shale, chert and conglomerate with hard, resistant meta-volcanic (greenstone) and meta-sedimentary (metagraywacke) rock in the project vicinity[23]. Regional structural features (rock bedding/foliation) trend north-northwest, with highly variable dip[24].

3. Regional Faulting and Seismicity

Northern California is a seismically active region and has been subject to numerous large earthquakes during recorded history. The following is a list of historic >6.0 Richter magnitude earthquakes, which likely affected the project site[25]. This list is not exhaustive, but is only meant to indicate the likelihood of the site experiencing seismically induced ground shaking in the future.

1868 – Hayward Fault. A 7.0 Richter magnitude earthquake struck near Hayward, California, on October 21, 1868, known as "The Great San Francisco Earthquake" until that title was expropriated in 1906, strong ground shaking was pervasive throughout the San Francisco Bay Area, and a Modified Mercalli Intensity (MMI) of II to IV was estimated in central Mendocino County. 30 people were killed and an estimated $350,000 was lost to damages. An explanation of the MMI scale is given in Table 4.1-2.

[23] California Division of Mines and Geology, 1960, Geologic Map of California, Ukiah Sheet
[24] Blackburn Consulting Inc (BCI), October 11, 2006, Slope Stability Analysis – Harris Quarry Final Face
[25] California Historical Earthquake Online Database, California Geological Survey, 2007, obtained from http://www.consrv.ca.gov/CGS/rghm/quakes/historical/index.htm

1892 – Blind Thrusting along Great Valley – Coast Range border region. Two earthquakes on April 19 and April 21, 1892 struck in the Vacaville-Winters area. Richter Magnitude 6.6 and 6.4 earthquakes led to an MMI of about IV in the Central Mendocino County area. The earthquakes resulted in three deaths and approximately $225,000 in damage.

1898 – San Andreas Fault. A Richter Magnitude 6.7 earthquake struck near Fort Bragg, Mendocino County on April 15 1898. Ground shaking intensity for central Mendocino County was estimated to be VII on the MMI scale. There were reports of considerable damage along the Mendocino coast, but no loss estimates are available.

1906 – San Andreas Fault. A Richter Magnitude 7.8 earthquake struck near San Francisco on April 18, 1906. Known as the Great San Francisco Earthquake, it (along with the fire it started) destroyed much of San Francisco, and MMI values of VII to VIII were felt as far as central Mendocino County. An estimated 3,000 lives and $524 million in property were lost.

1954 – East of Arcata. A Richter Magnitude 6.6 earthquake struck on one of the active faults directly east of Arcata (the Falor, Fickle Hill, Mad River, McKinleyville, Blue Lake, and Trinidad faults are all just east of Arcata). Ground shaking was likely experienced in central Mendocino County due to this earthquake.

1992 – Cape Mendocino. Three earthquakes of Richter Magnitudes 7.2, 6.6, and 6.6 occurred on April 25 and 26, 1992, near Cape Mendocino. These earthquakes likely caused at least moderate shaking in the central Mendocino County area.

Faults zoned as active, or conditionally active by the California Division of Mines and Geology (those experiencing surface rupture or seismic activity within the past 11,000 years, or 700,000 years, respectively) within 50 miles of the site are listed below[26] (CDMG, 1997).

The intensity of ground shaking felt in the site vicinity from future earthquakes will depend on several factors, including the distance of the site to the earthquake focus, the magnitude and the duration of the earthquake, and the response of the underlying soil and/or bedrock. The Modified Mercalli Intensity (MMI) Scale is commonly used to measure earthquake effects due to ground shaking. The Modified Mercalli Intensity scale is summarized on Table 4.1-2.

The California Geological Survey's Probabilistic Seismic Hazards Assessment has predicted peak ground acceleration at the site to be approximately 60% of the acceleration due to gravity[27], which correlates with a modified Mercalli intensity of VIII to IX, very strong to violent[28]. These values for peak ground acceleration are estimated by

[26] C. W. Jennings, Fault Activity Map of California and Adjacent Areas, 1994, California Division of Mines and Geology.
[27] California Geological Survey, Probabilistic Seismic Hazards Assessment, April 2003, obtained from http://www.consrv.ca.gov/CGS/rghm/pshamap/pshamain.html
[28] Wald, D., et al, Relationships Between Peak Ground Acceleration, Peak Ground Velocity and Modified Mercalli Intensity in California, 1999, Earthquake Spectra, Volume 15, Number 3.

the California Geological Survey to have a 10 percent probability of being exceeded within the next 50 years.

Table 4.1-1
Active and Conditionally Active Faults Within 50 Miles of the Project Site

Fault	Distance from Site (miles)	Direction from Site	Activity Status	Maximum Moment Magnitude[29]
Maacama	0.3	East	Active	7.4
Bartlett Springs	20.3	Northeast	Active	7.3
Round Valley	32.2	North	Active	7.1
San Andreas	28.7	West	Active	7.9
Big Valley	36.5	Southeast	Active	--
Konocti Bay	40.4	Southeast	Active	--
Collayami	41	Southeast	Conditionally Active	--
Whale Gulch	50	Northwest	Conditionally Active	--

4. Site Geology of the Quarry Area

The following sections describe the observations of the existing quarry and proposed expansion areas and conclusions and recommendations by BCI as presented in the report titled *Engineering Geology And Geohazards Report, Harris Quarry, Willits, California dated December, 2004.* A geologic map of the Harris Quarry site and vicinity adapted from several sources including the BCI map, work by Pampeyan and others, the California Division of Mines and Geology and others is presented as Figure 4.2-2 (in the subsequent Section 4.2, Hydrology). This map shows Franciscan greenstone, a zone of apparently highly fractured and sheared rock roughly paralleling Black Bart Drive, and undifferentiated Franciscan Complex rocks elsewhere. The geologic map also shows the location of faults, landslides, and springs.

a. Physiography

The present operating quarry is situated along the southwestern edge of a steep sided, northwest-trending ridge. The quarry floor elevation is approximately 1850 feet above mean sea level. The existing excavated slopes rise above the floor of the quarry as high as about 350 feet. From visual estimates and review of the site topographic maps, the quarry face slopes at an overall gradient of about 1.25:1 (horizontal to vertical). The native slopes along the southern edge of the ridge are steep and sparsely vegetated. They continue below the quarry floor to an ephemeral tributary of Forsythe Creek at about 1,600 feet in elevation. The native slopes north of the ridge are relatively flatter and more heavily vegetated with tanoak, true oaks, Madrone, and Douglas fir.

[29] Working Group on California Earthquakes (2007), 2008. Uniform California Earthquake Rupture Forecast, Version 2. USGS Open-File Report 2007-1437. Obtained from http://pubs.usgs.gov/of/2007/1437/

Table 4.1-2
Modified Mercalli Intensity Scale[30]

Scale	Intensity	Effects
I		Not felt.
II		Felt by persons at rest, on upper floors, or favorably placed.
III		Felt indoors. Hanging objects swing. Vibration like passing of light trucks.
IV		Hanging objects swing. Vibration like passing of heavy trucks. Standing motorcars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frame creak.
V	Light	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	Moderate	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Objects fall off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and poorly constructed or weak masonry cracked. Trees, bushes shaken (visibly, or heard to rustle).
VII	Strong	Difficult to stand. Noticed by drivers of motorcars. Hanging objects quiver. Furniture broken. Damage to poorly constructed or weak masonry. Weak chimneys broken at roofline. Fall of plaster, loose bricks, stones, tiles, and cornices. Some cracks in average unreinforced masonry. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged
VIII	Very Strong	Steering of motorcars affected. Damage to average masonry and partial collapse. Some damage to reinforced masonry, but not to that specially designed for seismic loading. Fall of stucco and some masonry walls. Collapse of chimneys, factory stacks, monuments, towers, and elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	Violent	General panic. Poorly built or weak masonry destroyed; average unreinforced masonry heavily damaged, sometimes with complete collapse; reinforced masonry seriously damaged. (General damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X	Very Violent	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XII	Very Violent	Rails bent greatly. Underground pipelines completely out of service.
XII	Very Violent	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

[30] Wood and Neumann, (1931), Modified Mercalli scale of 1931, *Bulletin of Seismological Society of America*, **21**, 277-283.

b. Faulting

No active faults are known to traverse the quarry site, although BCI observed three minor faults within the quarry face. These faults strike northwest, and dip steeply (~60%-80%) to the northeast and southwest. These may be related to two lineaments mapped as crossing the site by Pampeyan and others[31]. BCI interpreted these as possible, but inconclusive, recent fault breaks based on alignment of topographic features. A summary of fault and lineament features is shown on Figure 4.2-2.

c. Slope Stability

Quarry Area

BCI did not identify any landslides as occurring within the Harris Quarry expansion project boundary or nearby areas during site reconnaissance or review of published geologic maps and aerial photographs[32]. Although landslides are common within the weaker Franciscan rock near the site and landslides are mapped within the fault zone to the east of the site[33], the hard, volcanic and meta-volcanic rock exposed along the natural slopes of the site and the quarry face typically preclude large slope failures. Minor wedge failures and rockfalls at fractures, joints, and bedding intersections, can be expected within areas of highly fractured rock. During strong seismic ground shaking events it is anticipated that additional wedge failures and rockfalls will occur.

Asphalt Processing Facility

No landslides have been mapped in the proposed asphalt processing facility area, but cuts and fills proposed for the area may be unstable. While the quarry project area is underlain by hard, massive, volcanic and meta-volcanic rock, the asphalt processing facility is proposed for an area of unknown subsurface conditions. The area is mapped as Franciscan and much of the Franciscan bedrock in the region consists of cohesive blocks of rock in a tectonically sheared mélange of weaker sandstone and/or shale. Cut and fill slopes of 1:1 and 1:1.5, respectively are proposed in the processing area. Native slopes in the area generally do not exceed 2:1, and the proposed cut and fill slopes may be unstable at the proposed final slopes if underlain by weak sedimentary and meta-sedimentary sheared bedrock.

d. Soils

Quarry

According to the United States Department of Agriculture's Soil Survey for Eastern Mendocino and Southwestern Trinity Counties, the soil distribution in the project vicinity

[31] Pampeyan, E.H., Harsh, P.W., and Coakley, J.M., 1981, Preliminary Map Showing Recently Active Breaks Along the Maacama Fault Zone Between Laytonville and Hopland, Mendocino County, California; USGS MF-1217.
[32] BCI, Engineering Geology and Geologic Hazards Report, Harris Quarry, Willits, California, December 9, 2004
[33] Alquist-Priolo Fault Evaluation Report 123, Figure 3A, California Department of Conservation, California Geological Survey, July 8, 1981.

consists of the following regimes, with associated soil descriptions. The existing quarry area south of the ridge and much of the area south of the quarry between Forsythe Creek and US Highway 101 is comprised of the Squawrock – Witherell Complex, 50% - 75% slopes. It consists of 50% Squawrock, 35% Witherell and 15% minor constituents.

The **Squawrock** is a well-drained soil, made up of residuum weathered from sandstone, with a very low water capacity. Typical profile is as follows: 0-7 inches – cobbly loam; 7-16 inches, very cobbly clay loam; 16-21 inches, very gravelly sandy clay loam; 21-24 inches, un-weathered bedrock.

The **Witherell** is a somewhat excessively drained soil made up of residuum weathered from sandstone, with a very low water capacity. Typical profile is as follows: 0-7 inches, sandy loam; 7-12 inches, gravelly loam; 12-16 inches, un-weathered bedrock.

The slopes on the northern side of the ridge are of the Pardaloe – Kekawaka – Casabonne Complex, 50% to 75% slopes, which consists of 35% Pardaloe, 20% Casabonne, 20% Kekawaka, and 25% minor constituents.

The **Pardaloe** is a well-drained soil made up of residuum from weathered sandstone and shale, with a low available water capacity. Typical profile is as follows: 0-10 inches, gravelly loam; 10-27 inches, very gravelly sandy loam; 27-58 inches, very gravelly loam; 58-62 inches, un-weathered bedrock.

The **Kekawaka** is a well-drained soil made up of residuum from sandstone and siltstone, with a high available water capacity. Typical profile is as follows: 0-4 inches, loam; 4-35 inches, clay loam, 35-61 inches, clay.

The **Casabonne** is a well-drained soil made up of residuum from sandstone and shale, with a moderate available water capacity. Typical profile is as follows: 0-15 inches, gravelly loam; 15-43 inches, clay loam; 43-58 inches, gravelly clay loam; 58-62 inches, un-weathered bedrock.

Asphalt Processing Site

Soils in the proposed processing area are of the Yorkville-Yorktree-Squawrock Complex, 30% to 50% slopes. This complex consists of approximately 45% Yorkville, 25% Yorktree, 15% Squawrock and 20% other soils.

The **Yorkville** series is a moderately well drained soil made up of colluvium/residuum derived from greywacke, schist, and/or shale, with a very high available water capacity. Typical profile is as follows: 0-15 inches, loam; 15-41 inches, clay; 41-60 inches, gravelly clay loam, clay loam.

The **Yorktree** is a well drained soil made of colluvium derived from greywacke, schist, and/or shale, with a moderate available water capacity. Typical profile is as follows: 0-12 inches, loam; 12-24 inches, gravelly clay loam; 24-42 inches, clay; 42-51 inches, gravelly clay; 51-55 inches, bedrock.

5. Groundwater

Groundwater at the site is present primarily in bedrock fractures, and is encountered periodically in open fractures during quarrying. Groundwater flow is related to fractures, faults, joints, bedding surfaces and other structural features in the bedrock. In addition, surface colluvial soils and zones of weathered bedrock can contain some local, seasonal, and often perched groundwater. The Franciscan Complex is a complexly folded, faulted and fractured sequence of rock materials. The Franciscan has experienced a long history of tectonic movement along the boundary of the Pacific and North American tectonic plates. The nearby Maacama fault, located 0.3 miles to the east, generally follows a trough created by weakened rocks; it has deformed an area around the fault that includes the Harris Quarry site. According to mapping by Pampeyan and others,[34] potentially active fault lineaments of the Maacama Fault Zone cross the subject property. Mapping by BCI has confirmed that steeply dipping faults are present within the quarry face that may be related to active or potentially active faulting along the Maacama Fault Zone. Fault and fracture features such as these can act as water barriers, creating high groundwater on one side of the fault or fracture and depressed groundwater on the opposite side of the fault trace. In addition, the more pervasively sheared and fractured rock along faults often provides the open joints where downward percolating groundwater can move and accumulate. Springs are typically common along such fault zones, where fault movement has offset or disrupted subsurface pathways of groundwater movement.

Typically, the relative amount and size of fractures and openings in Franciscan bedrock decreases with depth, so drilling deeper wells does not often result in finding additional water where nearby shallow wells are dry. However, the volume of water stored in such rock fractures, the rate of recharge, and the direction and rate of movement are very difficult to predict even by pump testing. These water bearing fractured rock zones create springs where the rock fractures direct water to surface outcrops. The rock fracture and joint openings are also the primary source of water for hard rock wells in Franciscan terrain.

During their site reconnaissance, BCI did not observe any surface water at the site. No springs or other evidence of shallow groundwater was observed in the immediate quarry area. The locally fractured nature of the rock apparently allows it to readily infiltrate any surface water, which is consistent with reports from the quarry operator[35].

A number of wells have been drilled in the quarry vicinity. There are several shallow wells (less than 35 feet deep) along the north side of the quarry. At the southeast side of the existing quarry, a 500-foot deep dry hole was drilled, indicating variable groundwater occurrence in the quarry vicinity. This dry hole is located on the east side of structural lineaments in the area. Two wells are present to the north of the existing quarry, listed as Shallow Well and Quarry Well on maps produced for the applicant (see hydrology section, Figure 4.2-2). Water levels within the Quarry Well are at a depth of approximately 29 feet below ground surface. These wells are located on the north-facing slope of the hill located to the north of the existing quarry. These wells are

[34] Pampeyan and others, 1981.
[35] BCI, 2004

located in the vicinity of northwest-southeast structural lineaments that pass through the quarry area.

Several springs are present to the north and west of the quarry area, in an area mapped as having intensely fractured sedimentary and meta-sedimentary bedrock. These springs, which provide some residents of the Ridgewood Subdivision with water, are north of the hill located north of the quarry in an up-gradient surface water direction. Based on the location of the dry well to the south of the hill and the shallow groundwater levels to the north of the hill, there does not seem to be a connection of groundwater between the north side of the hill and the south side in the quarry vicinity.

6. Geologic Reconnaissance, Surficial Geology, and Exposed Bedrock

a. Existing Quarry

Reconnaissance geologic mapping by BCI verifies that the existing quarry area consists of predominantly hard rock consistent with volcanic and meta-volcanic rocks of the Franciscan Formation. Rock in the active quarry face is greenstone, a variable term applied to altered, basic igneous rocks which owe their color to minerals such as chlorite, hornblende and epidote. There are also zones of very hard, dark red chert and pillow basalts. The quarry rock is intensely (0.1-0.3 ft spacing) to slightly (1-3 ft spacing) fractured. The slightly fractured rock has a blocky texture and excavates into boulders of hard, durable rock. The intensely fractured rock is, in many places, friable and readily breaks down into small fragments of angular rock. Calcite and quartz fracture fillings are common throughout the rock mass. Rock fracture and foliation planes strike predominantly to the northwest and northeast, with variable dip. These planes can lead to wedge and block failures where they daylight on the quarry cut faces. Along the southeast-facing slope, minor wedge failures have occurred within the fractured rock, but in general the rock fracture and foliation planes are steeper than the overall cut face, and BCI did not observe evidence of large block slides or large wedge failures.

b. Expansion Area

As shown on Figure 3-4, the proposed quarry expansion area is north and west of the existing quarry. The existing slopes in the expansion area are typically very steep, with slope gradients in the range of about 3:1 north of the ridge, to about 1.5:1 in parts of the southern and western portions. The slopes are currently tree covered. Within the active quarry face, foliation planes strike predominantly northeast and northwest, dipping variably southeast, northeast and southwest. Minor faults are common, striking northwest and dipping steeply northeast and southwest.[36]

Bedrock in the expansion area is exposed mainly in road cuts and in scattered outcrops in ridge top areas. Bedrock in the western part of the expansion area, south of the ridgeline, consists predominantly of greenstone and related meta-volcanic rocks topped with approximately 20 feet of colluvium and intensely fractured sandstone. Bedrock in the northern part of the expansion area consists of sandstone and meta-sedimentary rocks. Sandstone bedrock is typically brown, intensely weathered, and fractured where exposed. The slopes on this side of the ridge are heavily vegetated with tan oak,

[36] BCI, 2004

Manzanita, hemlock and Douglas fir[37]. Bedding and fracture orientations were found to vary throughout the expansion area, with no through-going or pervasive bedding or fractured orientations observed.

c. Discussion and Conclusions of the BCI Report

Based on their initial evaluation, BCI concluded that with the incorporation of the guidelines provided in their report, the proposed reclamation plan is feasible from a geologic standpoint. Observations of the bedrock conditions exposed in the existing quarry indicate that the greenstone units generally perform well at inclinations as steep as 0.75 horizontal to 1 vertical (0.75h:1v), with no immediately obvious indications of slumping and failures.

While the bedrock units were found to be fractured throughout, BCI did not observe indications of a pervasive, adversely dipping fracture, bedding plane, or shear system that could be expected to create large-scale instabilities in the planned new quarry cuts. Conceivably, joint and fracture patterns may be present that could cause localized slab, toppling, or wedge failures in the quarried rock faces.[38] In addition, failures of soil and weathered rock are possible at the top of the finished quarry slopes, if excavated to 0.75h: 1v. However, the planned construction of intermediate benches on the completed slopes would provide catchments for localized failures, should they occur.

Given the wide variation noted in bedding and fracture orientations, predicting the likelihood or location of small failures would be problematic, even with extensive subsurface investigation. In addition, because rock slope failure is primarily controlled by discontinuities such as fractures or shear zones, obtaining meaningful numerical values for stability analysis of randomly fractured rock masses is also problematic. Based on the field data and comparisons to similar slopes in the existing quarry, BCI indicated that the potential for large, deep-seated failure of the bedrock in the planned 0.75h:1v finished quarry slopes appears low.

BCI recommended that along final cuts north of the ridge the uppermost 20 feet be cut at 1.5h:1v to account for weaker colluvium and intensely fractured sandstone. In addition, BCI recommended providing on-slope benches at 40-foot vertical intervals, with a minimum bench width of 12 feet.

Interim cut slopes, including internal faces during individual phases of operations prior to final excavation, should be evaluated in accordance with current Mine Safety and Health Administration (MSHA) requirements as quarry operations progress. Additionally the Office of Mine Reclamation (OMR) recommends slope stability analyses be performed when the quarry face progresses to within 150 feet of the final face cut to provide an opportunity to modify the final cut configuration as specific rock exposures dictate.

The majority of surface runoff is expected to infiltrate the fractured rock exposed along the final cut faces and intervening benches. Locally, areas of hard rock may limit infiltration, but high volumes of concentrated runoff are not anticipated. BCI recommended that the intervening benches be out-sloped 2% to avoid concentrated flow

[37] BCI, 2004
[38] BCI, 2006

and subsequent erosion of the benches. Additionally, disturbed slopes adjacent to the excavation should be protected from erosion by planting native vegetation, or other appropriate means.

The report prepared by BCI is acceptable for the preliminary analysis of the proposed quarry expansion. However, additional studies are required to provide the basis for additional mitigation measures for the quarry expansion project.

7. Reclamation Plan

Rau and Associates, Inc., of Ukiah, California submitted a reclamation plan for the Harris Quarry expansion, prepared January 2005, and amended in September 2006 (with a latest revision January 2010). The Reclamation Plan includes detailed descriptions of the three excavation phases planned.[39] The Plan also includes a schedule for synchronous reclamation during continued aggregate extraction. The schedule plans for a pilot slope re-vegetation of the uppermost slope prior to completion of phase 1 of quarry rock extraction. This pilot program will allow time to make adjustments to the reclamation plan, should they be deemed necessary.

8. Finish Grading Plan, Sections and Details

Rau and Associates, Inc. prepared a revised Final Grading Plan, Sections and Details for the site. In the Final Grading Plan dated January, 2010, the plan includes excavation of the quarry to the northwest. The final floor elevation will not change from the current elevation of 1,850 feet. The working face slopes of the quarry are proposed to be as steep as 1h:1v, or 45 degrees. This includes 0.75h:1v slopes with 12-foot benches every 40 feet. The benches are to have a 2% out-grade to prevent water build-up. The uppermost 25 feet, where the quarry face daylights, is to be constructed at a gradient of 1.5h:1v to accommodate weaker colluvium and friable sandstone layers. The proposed Grading Plan includes a single phase of extraction. The mining would expand to the north and west while maintaining the current elevation of the quarry floor (approximately 1,850 feet). This process will extract approximately 6 million cubic yards of material. The plan also includes a 24-foot wide, two-way road that connects the quarry with Highway 101 and the asphalt processing facility. Construction of this road will require cuts into the hillside. The plan includes erosion control plans for each phase of extraction. These plans include the use of berms, out slopes on benches, and sedimentation and infiltration ponds.

The proposed processing area for an asphalt plant is located to the northwest of the quarry. A Grading and Drainage Plan has been prepared by Rau and Associates dated March 2005 (with a latest revision January, 2010) for this element of the project. The Grading element shows 1h:1v cut slopes and 1.5h:1v fill slopes to create the level plant working area. A Geotechnical Evaluation of the proposed Harris Quarry Processing Facilities by Blackburn Consulting, Inc., dated March 28, 2005, concluded that the project is feasible provided that a design level geotechnical study is performed during final design.

[39] Rau and Associates, Inc., Amended Reclamation Plan for Harris Quarry, Willits, California, 2011.

An Erosion Control Plan by Rau and Associates dated March 2005 (with latest revision January, 2010) includes measures for erosion control of the processing plant area. These measures include silt fences, straw wattles, surface storm drains, and other measures typically included as best management practices for erosion control measures.

9. Regulatory Setting

Several regulatory acts and codes govern construction activities at the site and vicinity. These include the Alquist-Priolo Earthquake Fault Zoning Act, the Seismic Hazards Mapping Act, the Surface Mining and Reclamation Act, the California and Uniform Building Codes, the County of Mendocino General Plan, and the forthcoming Pre-Disaster Hazard Mitigation Program for Mendocino County.

a. Alquist-Priolo Earthquake Fault Zoning Act of 1972

The Alquist-Priolo Earthquake Fault Zoning Act was signed into law in 1972 as the Alquist-Priolo Geologic Hazard Zones Act. The name was subsequently changed to the Alquist-Priolo Special Studies Zones Act in 1975 and finally to the Alquist-Priolo Earthquake Fault Zoning Act in 1994. This Act required the state geologist to delineate zones of active faulting in the state and to require studies to be performed for projects located within the Earthquake Fault Zones (EFZs) delineated. The purpose of the act was to prohibit the location of most structures for human occupancy across active fault traces and to thereby mitigate the hazard of surface fault rupture. The site is located near, but not within, an Alquist-Priolo Earthquake Fault Zone.

b. Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act[40] was developed to assist local government in protecting the public from the hazards of strong seismic ground shaking, liquefaction, landslides or other ground failure, as well as other seismic hazards caused by earthquakes. The Act supports a program of mapping areas subject to the secondary effects of earthquake ground shaking including zones of liquefaction and landslides. Local government, including Cities and Counties, then require studies to investigate and mitigate the potential seismic hazard zones identified on the maps. To date, mapping efforts have concentrated on the large urban population centers of Southern California and the San Francisco Bay Area. No Seismic Hazard maps have been produced for the site and vicinity.

c. The Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (SMARA) provides for reclamation of mined lands and directs the State Geologist to classify land within California according to the presence or likely occurrence of significant mineral deposits.[41] The mineral land classification reports and maps are made available to the appropriate lead agencies,

[40]California Geological Survey, Seismic Hazards Mapping Act, 2004, online at http://gmw.consrv.ca.gov/shmp/SHMPAct.htm#2690

[41] California Geological Survey, 2004, website, http://www.consrv.ca.gov/cgs/minerals/mlc/index.htm

which are required to incorporate the information in their general land-use plans. Since 1975, known and potential mineral deposits have been mapped in about one third of the state under this project. The primary intent of the act was to create effective and comprehensive reclamation policies and regulations to reduce the adverse environmental effects and ensure mined lands are reclaimed to a usable condition. The act also encourages the production and conservation of mineral resources.

d. Surface Mining and Reclamation Standards

The County of Mendocino fully adopts the Surface Mining and Reclamation Act of 1975 and all the provision thereof. These provisions require that:

(A) Adverse environmental effects of surface mining operations are minimized, or, if possible, prevented, and that mined lands are reclaimed to a usable condition which is readily adaptable for appropriate alternative land uses;

(B) The production and conservation of minerals is encouraged, while giving consideration to values relating to recreation, watershed, wildlife, fisheries, range and forage, and aesthetic enjoyment;

(C) Residual hazards to the public health and safety are eliminated. (Ord. No. 4031 (part), adopted 1999.)

e. California and Uniform Building Codes

Title 24 of the California Code of Regulations, also known as the California Building Standards Code, sets minimum requirements for building design and construction. The 2010 version of the California Building Standards Code was adopted on January 1, 2011. The California Building Standards Code is a compilation of three types of building standards from three different origins:

- Building standards that have been adopted by state agencies without change from building standards contained in international model codes;
- Building standards that have been adopted and adapted from the international model code standards to meet California conditions; and
- Building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns[42].

The California Building Code incorporates the International Building Code (IBC), a widely accepted model building code in the United States, which is published by the International Code Council (ICC). The California Building Code also includes necessary California amendments as required by Title 24. The CBC of 2010, which has been mandated by the State of California, requires extensive geotechnical studies and has specific engineering requirements for grading, setbacks, benches, and drainage requirements for cut and fill slopes. Quarry construction shall be performed in accordance with building code requirements.

[42] California Building Standards Commission website at http://www.bsc.ca.gov/title_24/default.htm

f. County of Mendocino General Plan

The County of Mendocino has prepared a General Plan. This plan is designed to identify natural hazards such as earthquakes, flood, wildland fires, and other natural hazards. This plan includes seismic and safety elements which analyze impacts of hazards. The plan identifies policies and actions that may be implemented by the County to reduce the potential for loss of life and property damage in these areas based on an analysis of earthquakes, floods, wildland fires and landslides in terms of frequency, intensity, location, history, and damage effects. The Plan serves as a guide for decision-makers as they commit resources to reduce the effects of natural hazards.

g. Pre-Disaster Hazard Mitigation Program

The Robert T. Stafford Disaster Assistance and Emergency Relief Act authorized the Pre-Disaster Hazard Mitigation Program. Funding for the program is provided through the National Pre-Disaster Mitigation Fund to assist state and local governments in implementing cost-effective hazard mitigation activities that complement a comprehensive mitigation program. 44 Code of Federal Regulations (CFR) part 201, Hazard Mitigation Planning, establishes criteria for state and local hazard mitigation planning authorized by the Stafford Act. After November 1, 2003, local and tribal governments applying for PDM funds through the state will have to have an approved local hazard mitigation plan prior to the approval of local hazard mitigation project grants. The County of Mendocino has made an agreement with URS corporation for them to provide a Pre-Disaster Hazard Mitigation Plan (PDM) that meets the requirements for a Local Hazard Mitigation Plan (LHMP) and a Flood Mitigation Plan (FMP) for Mendocino County, the cities of Fort Bragg, Willits, Ukiah, and Point Arena[43].

B. Potential Impacts and Mitigations

1. Criteria Used for Determining Significance

According to CEQA Guidelines, exposure of people or structures to major geological hazards is considered a significant adverse impact. The potential geologic, soils, and seismic effects of the proposed project can be considered from two points of view: (1) construction disturbance impacts (in this case rock quarrying and processing); and,) (2) geologic hazard exposure to people or structures. The basic criterion applied to the analysis of construction impacts is whether construction of the project will create unstable geologic conditions that would last beyond the typically short-term construction period. However, in this case, since the project involves quarrying, construction related ground disturbance will be long-term. The analysis of geological hazards is based on the degree to which the site geology could produce hazards to people or structures from earthquakes, ground shaking, ground movement, fault rupture, or other geologic hazards, features or events.

According to CEQA Guidelines, the proposed project would have a significant environmental impact if it were to result in:

[43] Agenda for Mendocino County Board of Supervisors Meeting, May 22, 2007.

4.1a The exposure of 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 known fault;

4.1b The exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking;

4.1c The exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction and seismic-induced landslides;

4.1d The exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving landslides;

4.1e Development located on a geologic unit or soil that is unstable (or that would become unstable as a result of the project) and which could potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;

4.1f The loss of topsoil or result in substantial soil erosion.

4.1g Development located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial risks to life and property;

4.1h Development in areas where soils are incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;

4.1i The loss of availability of a known Mineral Resources important to the State of California or the local economy;

4.1j 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; or

2. Project Impacts

The project site is not within an Alquist-Priolo Earthquake Fault Zone (EFZ), although the Maacama EFZ is located about 1,500 feet to the east of the site. BCI noted three lineaments crossing the project site that may be associated with the Maacama EFZ; however, the project site is located outside of the Alquist-Priolo Earthquake fault zone, and the Engineering Geology and Geologic Hazards report by BCI noted that these lineaments had inconclusive (or lacking) evidence of recent movement. Therefore, this is a less-than-significant impact.

Expansive soils are often associated with Franciscan bedrock, however the quarrying activities will remove the soil overburden and no structures are planned in the quarry area. Therefore expansive soils are not considered a significant impact. In the processing plant area, some minor amounts of expansive clay soils may be present.

However, the presence of these soils will be a less-than-significant impact when grading the pad for the processing of materials.

The project is a quarry intended to extract a known mineral resource. Therefore, loss of mineral resources is not a significant impact. The project would not result in the loss of a mineral recovery site.

Quarry Unstable Slopes

Impact 4.1-A Quarry activities could result in unstable slopes.

Rau and Associates, Inc. prepared a Final Grading Plan, Sections and Details for the site. The Final Grading Plan, with a final revision dated January 2010, includes excavation of the quarry to the north and west, maintaining the current quarry floor elevation of 1,850 feet. The working face slopes of the quarry are proposed to be as steep as 1h:1v, or 45 degrees. This includes 0.75h:1v slopes with 12-foot benches every 40 vertical feet of elevation. The benches will have a 2% out-grade to prevent concentrated runoff. The uppermost 25 feet, where the quarry face daylights, will be constructed at a gradient of 1.5h:1v to accommodate weaker colluvium and friable sandstone layers. The proposed Grading Plan would remove a total of approximately 6 million cubic yards of material. The plan also includes a 24-foot wide, two-way road that connects the quarry with Highway 101 and the asphalt processing facility. Construction of this road will require cuts into the hillside. The plan includes an erosion control plan. This plan includes the use of berms, out slopes on benches, as well as sedimentation and infiltration ponds.

No landslides are shown on published geologic mapping, and BCI did not identify any landslides during their site reconnaissance or review of aerial photos. Landslides are common within weaker areas of the Franciscan Complex in the vicinity of the site, and landslides are mapped in the fault zone to the east. However, the overall hard, durable rock exposed on the native slopes as well as the quarry face generally precludes large scale slope failures such as translational or rotational rock slides, earthflows and debris flows. Small-scale slope instabilities are expected to occur following excavation of slopes to the 0.75h:1v steepness. The upper portions of cuts will be excavated in the soil and weathered rock creating instabilities at the soil/rock interface.

A stability analysis of the finished quarry slopes has been performed by BCI. The computer program RockPack III was utilized with the proposed cut orientations to evaluate potential plane failures and/or out-of-slope wedge failures. The cut slopes at both the overall 1:1 and localized 0.75:1 gradients were evaluated. Considering rock type and the generally tight and irregular nature of most discontinuities at the site, BCI stated actual strengths are likely to be higher than those used for the analysis. Based on that analysis, rock cuts are expected to be stable at the proposed slopes without reinforcement. However, there may be isolated, thin slabs of rock (generally less than about 5 feet thick) that will release onto the proposed benches during and/or after excavation[44].

[44] BCI, 2006

The State Mining and Geology Board Reclamation Regulations establish minimum standards for the stability of reclaimed mining slopes. Section 3704(f) of the Surface Mining and Reclamation Act and Associated Regulations requires that "cut slopes, including high walls 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."[45] Factors of Safety of 1.3 to 1.5 are generally considered to be appropriate for permanent quarry faces. The factors of safety for the cut slopes proposed for the project have been analyzed by BCI, who found that for the proposed 0.75h:1v slopes, the Factor of Safety (FOS) against plane failure ranges from 0.7 to 0.9, depending upon the orientation of the cut face[46]. Therefore, implementing the proposed plans is likely to result in plane failures on cut slopes, especially during seismically induced ground shaking. The slabs of rock released by plane failures on the proposed 0.75h:1v final slopes will likely be up to about half as thick (~five feet) as the intervening benches are wide. This will lead to a final cut face that will be very hard to reclaim, as the numerous small-scale plane failures will lead to a large-scale scree slope lacking a foothold for re-vegetation. This is considered a ***potentially significant impact***.

Mitigation Measures

4.1-A.1 Prior to the start of the second year of grading in the quarry expansion area, and annually thereafter, a licensed Geotechnical Engineer and Certified Engineering Geologist shall inspect the slopes of the quarry excavation and perform a slope stability evaluation. The evaluation shall determine whether the excavated quarry face meets the slope stability performance criteria, which are a minimum pseudo-static factor of safety of greater than or equal to 1.1, and a static factor of safety of greater than or equal to 1.3.[47] The evaluation shall include a determination 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 potential static and dynamic quarry slope conditions shall be consistent with the provisions of the California Division of Mines and Geology Guidelines for Evaluating and Mitigating Seismic Hazards (CGS Special Publication [SP] 117, 1997). In the event that the evaluation determines that the slopes do not meet the slope stability performance criteria, the evaluation shall include recommendations for revisions to the grading plan that will ensure compliance with the criteria.

4.1-A.2 The uppermost 20-foot quarry cut shall be sloped no steeper than 1.5h:1v in accordance with recommendations of the report prepared by Blackburn Consulting (Cut Slope Evaluation for Harris Quarry Haul Road (BCI) February 2007, with addendum dated July 2008).

[45] California Department of Conservation, Office of Mine Reclamation, Surface Mining and Reclamation Act, 1975, page 61, obtained from http://www.consrv.ca.gov/OMR/smara/010107Note26.pdf

[46] BCI, 2006

[47] The pseudo-static factor of safety was derived from the CGS SP117, while the static factor of safety of 1.3 is based upon an acceptable engineering standard for stability of temporary slopes.

4.1-A.3 Final cut slopes on the quarry walls shall be cut at the gradient required to attain a factor of safety of 1.3, with intervening 12-foot benches every 40 vertical feet.

Impact Significance After Mitigation

Incorporation of the mitigation measures listed above will ensure stable quarry slopes during mining operations and at the completion of mining. The measures reduce the impact of unstable slopes to a ***less-than-significant*** level.

Unstable Slopes at the Processing Facilities Site

Impact 4.1-B Unstable geology and slopes at the asphalt processing facility site could cause failure of improvements at that site.

A Grading and Drainage Plan has been prepared by Rau and Associates dated March 2005 (with a most recent revision dated January 2010) for the asphalt processing facility. The grading element shows 1h:1v cut slopes and 1.5h:1v fill slopes to create the level plant working area. A Geotechnical Evaluation of the proposed Harris Quarry Processing Facilities by Blackburn Consulting, Inc., dated March 28, 2005 (which is the same processing pad included as part of the current project), concluded that the project is feasible provided that a design-level geotechnical study is performed during final design and improvements are built per the recommendations of that report.

An Interim Erosion Controls Plan by Rau and Associates dated March 2005 (with most recent revision January 2010) includes measures for erosion control of the processing plant area. These measures include silt fences, straw wattles, surface storm drains, and other measures typically included as best management practices for erosion control measures.

The asphalt processing site is located on massive, hard, Franciscan Complex volcanic and meta-volcanic bedrock. This type of material is generally not considered an unstable geologic material. However, the proposed asphalt facility is located in an area where the precise subsurface conditions are not known. Unstable sheared bedrock including sandstone, meta-sedimentary and mélange materials may be present in the area underlying the 5.7 acres that would be developed for the asphalt facility. Proposed cut slopes would be as steep as 1h:1v, and proposed fill slopes would be 1.5h:1v. Native, undeveloped slopes are generally not steeper than 2h:1v. The proposed slopes would be potentially unstable if constructed in areas of unstable geologic materials such as sheared sandstone, meta-sedimentary, and mélange rock units, and they could fail during and following construction leading to mass wasting and landsliding in the asphalt plant area. The proposed slopes could also be unstable if not correctly designed and constructed, and settlement would be expected in the up to 75-foot thick fill slopes. This could result in cracking or other damage to concrete foundations, pavement, and other improvements.

Soil and rock materials that move during mass wasting and landsliding could potentially enter Forsythe Creek, which is located at the toe of the slope below the proposed processing area. This would increase sedimentation of the creek and other downstream receiving streams and could potentially block the creek with soil and rock.

In addition, petrochemicals and other hazardous materials will be stored on the site. A mass failure of the pad could result in toppling or rupturing of storage facilities, allowing escape of hazardous materials outside the planned spill detention areas. These materials could enter Forsythe Creek with consequent adverse impacts on water quality and fish and aquatic species, as well as potentially on human heath.

The area to be graded for the asphalt processing facility pad could have expansive soils, and these soils would need to be treated accordingly when preparing the new fills. The potential for slope failure is a ***potentially significant impact***.

Mitigation Measures

4.1-B.1 A Certified Engineering Geologist and a Geotechnical Engineer shall be identified to conduct the mitigation measures recommended below. The choice of Certified Engineering Geologist and Geotechnical Engineer shall be approved by the County Department of Planning and Building Services.

4.1-B.2 The processing building pad will be designed and constructed to be stable for the maximum credible earthquake for the area. A design-level Geotechnical Investigation shall be performed in the area of the proposed asphalt processing area that will identify design measures needed to ensure building pad stability, including for the design seismic event. The following will be included in the design-level Geotechnical Investigation.

1) The investigation shall specifically address the feasibility and long-term stability of 1h:1v cut slopes and 1.5h:1v fill slopes. A slope stability analysis of proposed cut and fill slopes will be performed. Recommended maximum gradients for cut slopes and engineered fill slopes required to maintain a 1.3 static factor of safety will be determined.
2) The potential for generating landslides and other mass wasting in the underlying geologic materials from loading with fill soils on slopes and removal of toe support in cut slopes shall be evaluated.
3) The potential for settlement shall also be addressed and the analysis shall include characterization of gross settlement, differential settlement, and dynamic (earthquake induced) settlement within and between adjacent materials. The study will include design recommendations for structural footings and foundations to minimize future settlement.
4) Specific design mitigation measures for long-term stability of the cut and fill slopes shall be developed. These mitigation measures are anticipated to include construction of bedrock keyways underlying all fill slopes, installation of subsurface drainage measures to drain the contact between underlying bedrock/soils and overlying engineered fill soils, the use of Geogrid

stabilization fabrics in the engineered fill to allow for construction of stable slopes at slope steepness greater than 2h:1v, and other design measures as identified by the Certified Engineering Geologist and Geotechnical Engineer of record for the project.

5) Design Review and Approval of Plan Sheets will be done by the Mendocino County Public Works and Building Departments to ensure conformance with Grading and Drainage Ordinances and the recommendations of the final geotechnical report.

6) Construction observation and testing (special inspections) will be done during construction to ensure conformance with design requirements and geotechnical recommendations.

4.1-B.3 The site of proposed fills in the west-southwestern portion of the expansion area will also be evaluated and appropriate measures to stabilize proposed fills shall be determined and incorporated into project design, consistent with the requirements of Section 3704(d) of the State Mining and Geology Board Reclamation Regulations. Proposed fills shall be properly compacted to a minimum 90% compaction relative to the maximum dry density and shall be no steeper than 2h:1v unless measures to reinforce the fills are included in project plans and a slope stability analysis is completed by the Project Geotechnical Engineer and Certified Engineering Geologist which finds that proposed fills will be stable.

Impact Significance After Mitigation

The site does not appear to contain unusual geologic or soil conditions. It is expected that requiring standard geotechnical engineering practices would result in a stable processing pad. Implementation of these mitigation measures will reduce the impact of unstable geologic units to a ***less-than-significant*** level.

Seismic Hazards

Impact 4.1-C The project site is subject to seismic events and strong seismic ground shaking.

The California Geological Survey's Probabilistic Seismic Hazard Assessment anticipated that peak ground accelerations for the site are approximately 60% due to gravity, with a 10% chance of being exceeded in 50 years. Due to the large, very hard, resistant rock exposed along natural slopes of the site and within the active quarry face, large failure forms such as transitional or rotational rock slides, earthflows, and debris slides are not expected; however, small-scale (<5 feet) failures of the cut slopes are anticipated to occur in the finished quarry, as noted in impact 4.1-A. Numerous small-scale failures would be expected to occur in the event of seismically induced ground shaking. Small-scale failures may also occur in response to the use of explosives in the quarrying process. Benches to be constructed as part of the reclamation process will catch the majority of the small-scale failures.

The State Mining and Geology Board Reclamation Regulations establish minimum standards for the stability of reclaimed quarry slopes. Section 3704(f) of the regulations requires that cut slopes including high walls and quarry faces, shall have a minimum slope stability factor of safety that is suitable for the proposed end use and conform to the surrounding topography and/or approved end use[48]. The factor of safety against wedge failure for proposed cut slopes has been determined to range between 5 and 14+, depending upon the orientation of the cut. Factor of safety against plane failure is about 0.7 to 0.9, indicating the likelihood of the release of thin slabs onto benches during and/or after excavation[49].

The potential for major seismic events and strong ground shaking could lead to failures in quarry faces. Failures could threaten the health and safety of construction workers and future open space users. Existing off-site landslides located near the margins of the quarry could also be affected if quarry walls or quarry margins fail or become unstable.

Major seismic events and ground shaking could also jeopardize the proposed fill slopes at the processing facilities site. As noted in the previous impact, failure of this pad could result in significant water quality and biological impacts.

These are ***potentially significant impacts.***

Mitigation Measures

The mitigations recommended for Impacts 4.1-A and 4.1-B also apply to this impact.

Impact Significance After Mitigation

Incorporation of these mitigation measures will reduce the impact of seismic events and strong ground shaking to a ***less-than-significant*** level.

Access Road Cuts

Impact 4.1-D The new access road and the new road to the water tank could fail if not properly constructed.

The new access road connecting the quarry to the asphalt processing facility site requires a large road cut north of the intersection of the quarry's entrance road with Highway 101. Bedrock in this location consists of friable sandstone and meta-sedimentary rocks, which underlie about 5-10 feet of soil/colluvium. Excavation will expose weak bedrock and soil to the erosive forces of wind and water.

The cut section is into a northeast-facing slope with cut depths (measured from ground surface to road grade) of about 35 to 40 feet. Road cuts are planned to be at a gradient of 1.5h:1v, with a 12-foot wide mid-slope bench on the higher, upslope side. These

[48] California Department of Conservation, Office of Mine Reclamation, Surface Mining and Reclamation Act, 1975, page 61, obtained from http://www.consrv.ca.gov/OMR/smara/010107Note26.pdf
[49] BCI, 2006

slopes intrude into Franciscan Complex rock materials that are potentially unstable at this steepness. Failures of the road cuts could potentially block the access to the quarry and de-stabilize slopes in the area. This is a ***potentially significant impact***.

As shown on Figure 3-7, the new road to the water tank will be cut into the hillside with two minor fills near the tank. The road will be 12-feet wide. Road cuts are planned to be no greater than 1h:1v. These slopes may intrude into Franciscan Complex rock materials that are potentially unstable at this steepness. Failures of the road cuts could potentially block the access to the water tank and de-stabilize slopes in the area. This is a ***potentially significant impact***.

Mitigation Measures

To mitigate for the weak bedrock and erodible soils present in the proposed road cuts the following mitigation measures are recommended.

4.1-D.1 A Certified Engineering Geologist and a Geotechnical Engineer shall be identified to conduct the mitigation measures recommended below. The choice of Certified Engineering Geologist and Geotechnical Engineer shall be approved by the County Department of Planning and Building Services.

4.1-D.2 A design level Geotechnical Investigation shall be performed in the area of the proposed road cuts at the quarry entrance road and on proposed cuts along the access road to the water tank that will identify design measures needed to ensure building pad stability, including for the design seismic event. The investigations shall specifically address the feasibility and long-term stability of 1.5h:1v cut slopes for the main access road and 1h:1v cut slopes for the water tank access road. The potential for generating landslides and other mass wasting in the underlying geologic materials from removal of toe support in cut slopes shall be evaluated. Specific design mitigation measures for long-term stability of the cut slopes shall be developed. These mitigation measures are anticipated to include construction of bedrock keyways underlying all fill slopes, installation of subsurface drainage measures to drain the contact between underlying bedrock/soils and overlying engineered fill soils, the use of Geogrid stabilization fabrics in the engineered fill to allow for construction of stable slopes at slope steepness greater than 2h:1v, and other design measures as identified by the Certified Engineering Geologist and Geotechnical Engineer of record for the project.

4.1-D.3 The Geotechnical Investigation shall include slope stability analysis for the proposed road cuts to confirm that the proposed slopes meet minimum standards of stability such as factor of safety calculations. This study shall be performed by a Certified Engineering Geologist or Geotechnical Engineer.

4.1-D.4 Anticipated recommendations from the geotechnical investigations and slope analyses will include maximum proposed cut slope steepness which may vary from the proposed design, slope stabilization measures such as retaining walls, and other methods that may be identified during the slope stability analysis. Recommendations may also include alternative designs

such as biotechnical engineering techniques, gravity walls, buttress fills, reinforced fills, and other slope stabilization techniques.

4.1-D.5 A Civil Engineer shall design any required retaining walls, gravity walls, buttress fills, or other slope stabilization technique in accordance with recommendations of the geotechnical investigations and slope stability analysis and in accordance with County and State Guidelines.

4.1-D.6 An erosion control plan and planting plan shall be developed for stabilization of any soils excavated or exposed during construction activities.

Impact Significance After Mitigation

These measures are consistent with recommendations made in reports submitted by the applicant – "Geotechnical Report of Service Road and Water Storage Tank," BCI, August 2005 and :Cut Slope Evaluation for Harris Quarry Haul Road," (BCI) February 2007 (with addendum dated July 2008). Incorporation of these mitigations will reduce the impacts resulting from weak bedrock and erodible soils to a ***less-than-significant*** level.

Soil Impacts

Impact 4.1-E The proposed on-site wastewater disposal system could fail due to inadequate soils.

The applicant will construct an on-site wastewater treatment and disposal system to serve the project. The new facilities at the asphalt processing site will be serviced by a permanent septic system with on-site restrooms adjacent to the scale facilities at both the processing and quarry site. The location of the septic system, which has been designed and approved by Mendocino County, is about 100 feet north of the quarry well alongside the haul road (see Figure 3-4). This septic system will service 23 employees total. The system will need to be engineered and constructed to comply with existing County requirements for an on-site septic system. This ensures that the system will be constructed and operate in a manner to safely and adequately dispose of wastewater. Given existing County regulations governing private wastewater systems, the impact of developing this system would be ***less-than-significant***, and no additional mitigation would be required.

Impact 4.1-F Improper construction and operation of the project could result in soil erosion and the loss of topsoil.

Quarry expansion activities will result in the loss of topsoil and will expose soils and weathered rock to the possible effects of soil erosion. During construction of the 3.5-acre processing plant site, about 5.7 acres of land will be disturbed. Site-grading activities will remove vegetative cover, disturb, and expose soil that could become mobilized by stormwaters during construction activities. Of particular concern are the new fill slopes where mass wasting during construction and/or subsequent erosion could deposit sediments in Forsythe Creek. According to the Soil Survey of the area, the

exposed soils are potentially erodible silty and sandy soils. These soils are subject to the effects of erosion during and following site grading activities. Unprotected sandy soils will erode, resulting in the formation of rills and gullies during heavy seasonal rainstorms. The runoff from unprotected soil areas will include significant sediment loading that could cause increased turbidity and sedimentation in downstream receiving channels. Project impacts associated with soil erosion and topsoil loss are considered ***potentially significant.***

Mitigation Measure

The project shall comply with Mitigation Measures 4.2-A.1 through 4.2-A.6 and 4.2-B.1 through 4.2-B.3 as detailed in Section 4.2, Hydrology and Water Quality. These mitigations require the applicant to revise and implement a Storm Water Pollution Protection Plan (SWPPP) incorporating erosion control Best Management Practices (BMPs). They also require compliance with National Pollutant Discharge Elimination System (NPDES) requirements of the Construction General Permit and Industrial General Permit.

Impact Significance After Mitigation

Implementation of the cited mitigation measures will reduce erosion impacts to a ***less-than-significant*** level.

3. Cumulative Impacts

The project would not combine with the possible future expansion of the quarry to result in any cumulative impacts with the possible exception of unstable slopes at the quarry itself, and this is discussed below.

Impact 4.1-G Future expansion of the quarry could result in unstable slopes.

Future expansion of the quarry would result in similar slope stability concerns as described under Impact 4.1-A and 4.1-C. However, the current project would not make any contribution to this potential future impact since the project would be complete at the time that future expansion occurred, and because the slopes of the proposed project would be stable at the time any expansion was initiated. The project makes a ***less-than-cumulatively-considerable contribution*** to this future cumulative impact. It is expected that the County and the State will require assurances of slope stability as is required for this project when any application is made for future mining.

4.2 HYDROLOGY AND WATER QUALITY

A. Setting

1. Introduction

This section of the DEIR describes the existing hydrologic conditions of the Harris Quarry area and discusses the potentially adverse physical and chemical hydrologic and drainage impacts from the project. This analysis was prepared based on reviewing the following sources:

- Harris Quarry Use Permit and Reclamation Plan and Rezoning: Revised Project Description. Rau and Associates. Revised January 2010. Revised April 12, 2010.
- Harris Quarry—EIR Re-submittal and Project Description Modification. Memo to Mendocino County Planning and Building Services from Rau and Associates. February 10, 2010.
- Harris Quarry—Response to Air Quality Data Requests. Rau and Associates. November 29, 2010.
- Potential Impacts of Increased Groundwater Pumping to Supply Proposed Harris Quarry Expansion. Technical Memorandum to Northern Aggregates, Inc. from Ludhorff & Scalmanini. January 25, 2010. Revised November 19, 2010.
- Highway Improvement Plans: Highway 101 Channelization. Rau and Associates. January 2010. 26 sheets. Revisions through November 2010.
- Grading, Drainage and Interim Erosion Control Plans for Proposed Aggregate Processing Facilities. Rau and Associates. Revised February 2010. 11 sheets.
- Final Grading, Reclamation and Erosion Control Plans for Earth Products Removal. Rau and Associates. January 2010. 7 sheets. Revisions through November 2010.
- Harris Quarry Expansion Mitigation Plans. Rau and Associates. January 2010. 4 sheets.
- Harris Quarry: Preliminary Drainage Design Documentation, CalTrans Encroachment Permit. Rau and Associates. April 28, 2010.
- Harris Quarry: Drainage Design Documentation for EIR Review, Mendocino County Use Permit. Rau and Associates. May 7, 2010.
- Environmental Assessment and Reclamation Plan, Harris Quarry Expansion. Rau and Associates, 2005.N
- Stormwater Pollution Prevention Plan, September 2004, Northern Aggregates, Inc.
- Well Test for Quarry/Processing Plant Environmental Review at Harris Quarry South of Willits, Rau and Associates, April 2007.
- Well and spring location map, Jason McConnell, Northern Aggregates, February 2007.

- Mendocino County Water Agency Memorandum, June 2005.
- Site investigation, well and spring verification and mapping by Questa Engineering Corp, May 2007.

2. Topography and Climate

Harris Quarry is located immediately west of Highway 101 approximately five miles south-southeast of the town of Willits in Mendocino County, California. The study area includes the existing quarry and the area that is part of the proposed quarry expansion. In addition, several small, adjacent watersheds that could be affected by the proposed project are included within the study area. The terrain is moderately rugged to rugged, with elevations ranging from 1,600 feet to 2,078 feet above mean sea level. Forsythe Creek and some smaller tributaries of that creek lie to the southeast of the project area. (See Figure 4.2-1).

The climate of the region is characterized as Mediterranean. The region's rainy season extends between the months of October and April, with generally dry conditions for the remainder of the year. The highest rainfall months are November through February. The average annual rainfall for Willits is roughly 51.29 inches; minimum and maximum recorded annual precipitation is 30.31 inches (1985) and 91.6 inches (1983), respectively[50].

Temperatures in the area are relatively moderate, averaging 54 degrees Fahrenheit annually. Temperatures occasionally drop below freezing at night in the winter and can rise to over 100 degrees Fahrenheit during the summer months. Evaporation data for the region indicate seasonal rates of approximately 44.6 inches per year.[51]

3. Project Area Surface Water Hydrology

a. Russian River

The Harris Quarry is located roughly 1,200 feet east of Forsythe Creek, a major tributary of the Russian River (see Figure 4.2-1). 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 104 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 Mendocino, Sonoma, and Marin counties (Sonoma County Water Agency, 2003).

[50] "Willits, California – Climate Summary", Western Regional Climatic Center, Willits (049684), California Monthly Total Precipitation (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9684) Accessed April 9.2007.
[51] West Yost, Assoc, 2006. City of Willits Water Supply Planning Study.

b. Forsythe Creek

Forsythe Creek runs northwest-southeast approximately one-half mile west of the project site. Forsythe Creek enters the Russian River approximately sixteen miles downstream of Harris Quarry, north of the community of Calpella. Forsythe Creek is a fourth order stream with a drainage area of approximately 50 square miles and has approximately 14 miles of blue line stream, according to the USGS Ukiah, Redwood Valley, Laughlin Range and Orrs Springs 7.5 minute quadrangles.[52] Its major tributaries include Mill Creek, Baker Creek, Walker Creek, and Seward Creek. Elevations range from 2,600 feet in the headwaters to about 680 feet at the confluence with the Russian River. At the point closest to the site for the proposed processing plant, Forsythe Creek has an approximate elevation of 1800 feet. Historically, the creek has year-round flow, but may go dry during very dry years.[53] The watershed has a history of grazing and logging dating from the 1850's.[54] It is likely that many of the stream processes and stream conditions are a result of these land uses. Since 2002, the larger Forsythe Creek Hydrologic Sub Area (HSA), which includes Headwaters Russian River, Jack Smith Creek, and Walker Lake specific planning watersheds (SPWS) and portions of the City of Ukiah, has been listed as a USEPA 303(d) listed impaired water body for Sediment and Temperature.[55]

The Forsythe Creek HSA is also listed as critical habitat for the California Coastal Chinook Salmon (*Oncorhynchus tshawytscha*), which extends in Forsythe Creek from its confluence with the Russian River to a point just south of the confluence of Mill Creek and Forsythe Creek (latitude and longitude 39°27'80" and 123°26'08"[56], respectively), which is approximately 5 miles south of the project's Forsythe Creek tributary confluence with Forsythe Creek

The Forsythe Creek HSA is also listed as critical habitat for the Central California Coast Steelhead *(O. mykiss)* which extends in Forsythe Creek from its confluence with the Russian River to south of Forsythe Creek's confluence with Walker Creek (latitude and longitude 39°29'76" and 123°29'63", respectively), which is approximately 2 miles south of the project's Forsythe Creek tributary confluence with Forsythe Creek.

The CDFG field inventory of Forsythe Creek noted that salmonid migratory habitat on Forsythe Creek extends from the confluence with the Russian River to a series of natural

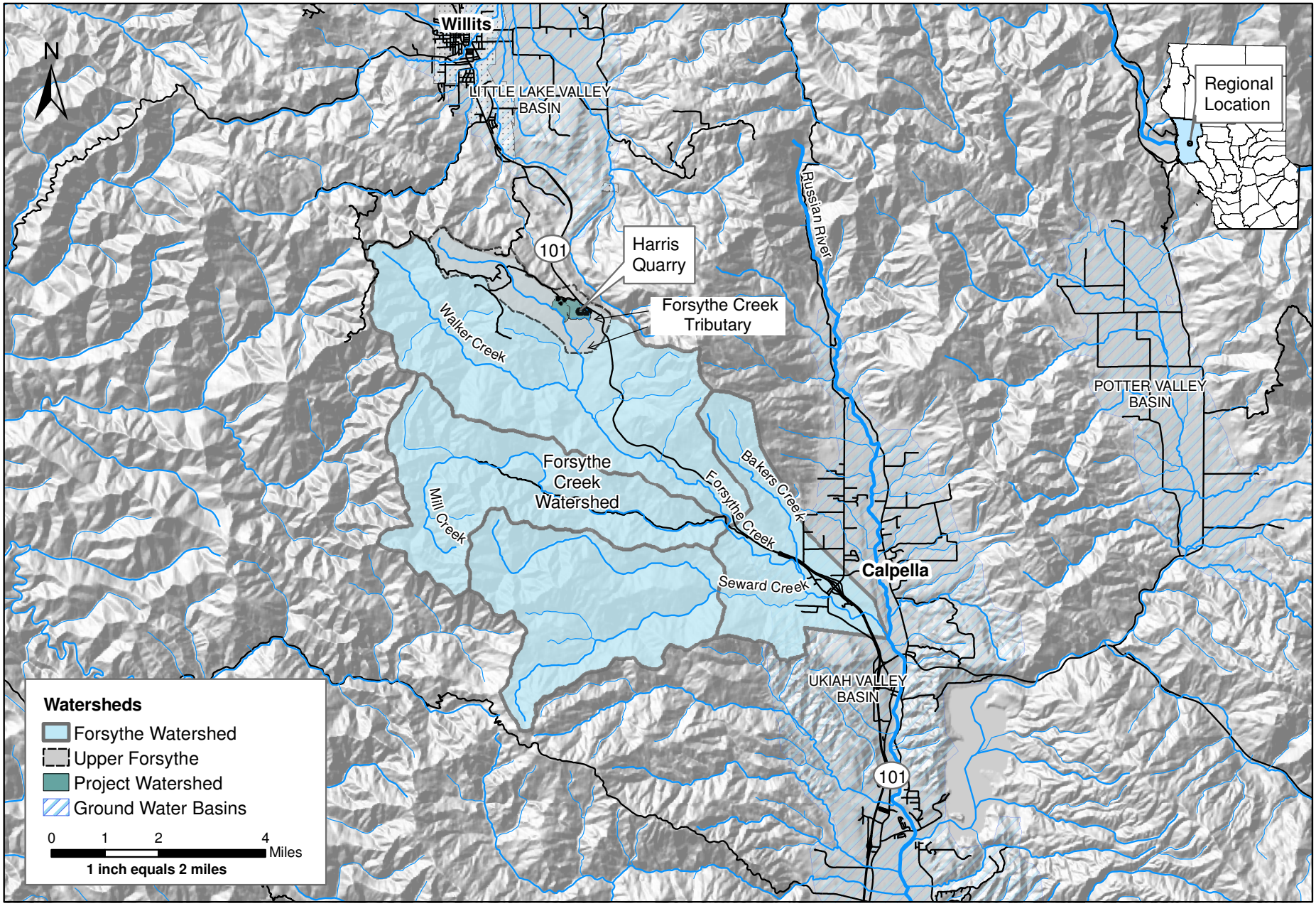
[52] The stream order signifies the relative position of a stream segment in a drainage network: the smallest, unbranched, intermittent tributaries are designated order 1; the junction of two first-order streams produces a stream segment of order 2; the junction of two second-order streams produces a 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.

[53] Resources Agency of California, Department of Fish and Game. 1963. Stream Survey.

[54] The Cultural Landscape Foundation, 2006.

[55] US Environmental Protection Agency, 2008. Section 303(d) List Fact Sheet for Russian River Watershed

[56] U.S. Code of Federal Regulations, Title 50 Chapter II Part 226. Designated Critical Habitat. Section 226.211. Critical habitat for seven evolutionarily significant units (ESUs) of salmon (*Oncorhynchus* spp.) in California.



Forsythe Creek Watershed
Harris Quarry, Mendocino County, CA

Figure 4.2-1

high gradient boulder falls that form a salmonid migration barrier roughly 0.2 miles downstream of the project tributary's confluence with Forsythe Creek.[57]

Forsythe Creek Tributary

A forked tributary of Forsythe Creek is located immediately to the south of the quarry mining area. The main tributary channel runs for 6,000 feet before joining Forsythe Creek and flows from west to east before curving back around to the south and flowing westerly into Forsythe Creek. The secondary tributary channel runs north-south from the southeast corner of the quarry site below the sump pond pipe outfall and enters the main tributary channel approximately 1,700 feet below the tributary headwaters. The tributary confluence with Forsythe Creek is approximately 2 miles downstream of the proposed processing plant site.

The main tributary was dry during the May 2007 investigation by Questa Engineering staff, and is likely a seasonal drainage. Large boulders, woody debris, and smaller side cast fill the channel at its midpoint, likely a result of natural active erosion processes and previous quarrying practices. The steep north-south drainage of the secondary tributary channel has incised and deepened the channel where it enters the main tributary. As a result, a knickpoint (headcut) is migrating up the main tributary, resulting in a 3-foot headcut in the main tributary just upstream of the confluence with the secondary channel. Thus, historical disturbances in the vicinity of the quarry have had some geomorphic impact on the channel processes.

Upper Forsythe Creek Watershed

To assess downstream impacts for the project site, an Upper Forsythe Creek watershed has been delineated. This Upper Forsythe Creek watershed extends from the headwaters of Forsythe Creek down to the confluence of the Forsythe Creek Tributary with the main Forsythe Creek. The Upper Forsythe Creek watershed covers 2.72 square miles (roughly 5% of the entire Forsythe Creek watershed), and its delineation is required to assess project impacts on overall peak flows in Forsythe Creek downstream of the project site.

4. Project Site Existing Drainage

The surface water contributions at Harris Quarry are in the form of overland flow from the mining and processing areas, roads, surrounding hill slopes, and the drainage channel running east of the existing quarry access road and Highway 101 at the eastern boundary of the quarry site.

Surface runoff from the project site can be divided into two major subbasins. One extends from Black Bart Drive to the north, encompasses the entire quarry site and southern slopes below the quarry, and includes the hillslopes east of Highway 101. This subbasin drains southeast to the Forsythe Creek Tributary. The second subbasin

[57] Resources Agency of California, Department of Fish and Game. Stream Inventory Report Forsythe Creek. Report revised April 14, 2006, report completed 2002, assessment completed 1999.

encompasses the proposed asphalt processing site and drains southwest directly to Forsythe Creek.

a. Existing Drainage in the Active Mining Area

The mining area is composed of gravel access roads, steep actively mined surfaces, and relatively flat benches where source material is accessed, stored, and transferred. Exposed bedrock and piles of overburden and crushed rock are the typical surface materials. Sparse trees, shrubs, and grasses cover the western upper slopes adjacent to the active mining area, while a woodland persists to the north. Most of the drainage of the active mining area occurs as overland flow directed to the quarry floor. The quarry floor is graded towards the face of the quarry, and a small sedimentation and detention pond has been excavated near the southwest edge of the existing quarry face. Runoff from the quarry face and floor drains towards the quarry face and this retention pond. The purpose of the basin is storage of sediment from quarry runoff, evaporation, and infiltration.

The quarry can contain runoff from a 100-year, 24-hour storm event without discharging to slopes or drainage channels off the site. Currently, the quarry does not discharge runoff from the quarry floor. Thus, the area of the quarry site that drains to the quarry floor can be excluded from calculations of surface runoff to the Forsythe Creek Tributary.

b. Existing Tributary Drainage

Excluding runoff from the quarry faces and floor, the tributary subbasin receives runoff from approximately 131 acres, and includes surface flow mostly in the form of overland flow and road drainage. Its upstream source of runoff is the area around and including Black Bart Drive. Flow is conveyed southeasterly via existing drainage swales lining Black Bart Drive to a culvert at Highway 101 which carries flow from the west side of the highway to the east side. A second culvert carries flow and additional runoff back to the west side of the highway to an open channel that parallels the existing quarry entry road. Three other culverts drain the hillslopes east of Highway 101 and convey flow west of the quarry road. Before entering the quarry area, the flow enters a 30-inch stormdrain, daylights in the area next to the scale house, then returns to pipe flow in a 36-inch corrugated metal pipe before discharging to the south-facing slope below the quarry. The flow from this outfall runs to the north-south secondary tributary channel.

During a May 2007 field review by Questa Engineering staff, it was noted that upstream of the quarry, the drainage has a channel width ranging from approximately 3-6 feet, and a depth from 1-4 feet. Flows were estimated to be around 0.5 cubic feet per second (cfs). There was no evidence of siltation, and the bed consisted primarily of cobbles, gravel, and coarse sands. Downstream of the quarry, the bed consists of larger cobbles, and there was an approximate 4 to 6 feet of vertical channel incision as flows have cut through the colluvial fill from the adjacent slopes and the confluence with the west to east running drainage. This indicates some minor quarry induced channel incision of the adjacent drainage.

The steep south-facing slopes below the quarry site are included in the tributary subbasin and drain to the section of the main tributary channel that runs west to east upstream of its confluence with the secondary channel.

c. Existing Asphalt Processing Site Drainage

The subbasin (currently undeveloped) that encompasses the proposed asphalt processing site drains directly to Forsythe Creek and consists of approximately 58 acres south of Black Bart Drive and west of the quarry site. Surface runoff drains in a southwesterly direction from Black Bart Drive to Forsythe Creek.

5. Project Site Flooding

The project site is not located within a 100-year or 500-year flood hazard zone, as mapped by the Federal Emergency Management Agency (FEMA) (FEMA, Flood Insurance Rate Map, Mendocino County, California (Unincorporated Areas), Panel 060183 0700 B, 1983).

6. Water Supply and Usage

a. Water Supply

Water for the project area is currently supplied by wells and springs located on the project property and, when needed, water purchased from an outside supplier.

Harris Quarry Production Well (Well 1)

Most of the existing and future water demands for the Harris Quarry will be supplied by groundwater pumped from Well 1. The well was drilled in January 2005 and is equipped with a ten-horsepower submersible pump. The well has a capacity of approximately 15 gpm, which is relatively high for a well completed in a fractured bedrock aquifer (Ludhorff & Scalmanini, 2010).

CDF Spring

Prior to construction of Well 1, an on-site spring known as the California Division of Forestry (CDF) Spring was used to supply much of the water used for dust suppression. The CDF Spring is located northwest of the active quarry, approximately 2/3 of a mile away from Well 1. The CDF Spring was formerly used for water supply by CDF (now CAL FIRE). The CDF spring was flowing at about 3 gpm during the March 2007 pump test conducted by Rau. The spring flow varies seasonally and had decreased to 0.3 gpm by the time of the September 2009 pump test (Ludhorff & Scalmanini, 2010).

Storage Tanks

The quarry currently uses four tanks to store water from Well 1 and the CDF Spring. Well 1 is pumped directly to a 5,000 gallon tank on the quarry floor, which is used primarily for dust control. At the CDF Spring, two 2,500-gallon tanks store water used for dust suppression. However, Well 1 is also currently plumbed to pump to the new 212,000-gallon tank located about 1,340 feet away from the well at an elevation of about 2,157 feet msl (173 feet above the elevation of Well 1). The new wash plant to be installed at the quarry will use a 20,000-gallon tank to recycle water used for aggregate

washing, and will also use a 10,000-gallon make-up water tank. The applicant proposes to remove the CDF Spring as a source of supplemental water for the project.

Storage Facility	Storage (Gal)	Status
Supplemental CDF Spring water tank (2) (dust)	5,000	existing
Quarry dust suppression (Well #1) water tank (1) (dust)	5,000	existing
Wash Plant		
Make-up water tank (1)	10,000	proposed
Clarification water tank (1 – unused))	20,000	existing,
Well #1 water tank (unused)	212,000	existing,

b. Water Demand

Water demand estimates for the existing quarry are summarized in Table 3.2 presented previously in Section 3.2(11)(a). At present, water use at the quarry is primarily for aggregate processing and dust control. Washing of aggregate for concrete and asphalt production is currently done at a separate facility operated by the applicant in Willits. Aggregate processing involves crushing and screening of rock removed from the quarry face by blasting. During processing, water is added using sprinklers to increase the moisture content of the aggregate and limit dust produced during crushing and screening. Aggregate processing occurs for a total of about 90 days during the peak operating season (June through October) and for about 30 days during the off season (November through May). Processing occurs at a higher rate for base rock than for other aggregate products. The processing rate is estimated to be about 250 tons/hour for base rock (two days per week) and 200 tons/hour for other products (four days per week).

The amount of water needed for processing varies depending on the season and the processing rate. During the peak season, the water demand for processing is about 6,250 gallons per day (gpd) when processing at the higher rate and 5,000 gpd at the lower rate. During the off season, the water demand for processing would be about 4,100 gpd at the higher rate and 3,250 gpd at the lower rate. The applicant estimates the total water demand for aggregate processing to be about 593,500 gallons per year or 1.8 acre-feet per year (afy).

Water used for dust suppression is sprayed by truck on the access roads, quarry floor, and stockpiles. Under Mendocino County regulations, the water truck is allowed to carry 2,400 gallons per trip, and three trips per day are required during the driest portion of the peak season (approximately 30 days). Two trips per day are typically required during the remainder of the peak season (approximately 90 days). This represents a water demand of about 7,200 gpd on the driest days and 4,800 gpd during the remainder of the peak season. During the off season, water required for dust suppression is much less, about one trip per day for 30 days; no water is required for dust control during the remainder of the off season. The total water demand for dust suppression is thus about 720,000 gallons per year or 2.2 afy.

As shown in Table 3-2, the total peak water demand under existing conditions is about 11,300 gpd or an average of 7.8 gallons per minute (gpm) based on a 24-hour pumping

cycle. The average water demand during all days of operation in the peak season is about 9,500 gpd (6.6 gpm for 24 hours). The total existing water demand at the quarry is estimated to be about 1,313,500 gallons per year (4.0 afy).

7. Groundwater Resources

a. Regional Groundwater

The project site is located outside of any of the groundwater basin boundaries defined by the California Department of Water Resources (Ludhorff & Scalmanini, 2010).The closest basin is the Little Lake Valley Groundwater Basin, located in the Eel River watershed. This groundwater basin includes Willits, and the southern portion of the basin is located about one mile north of the quarry site. The Ukiah Valley Groundwater Basin is located in the Russian River watershed and includes the southeastern portion of the Forsythe Creek watershed (beginning about five miles southeast of the quarry site). Outside of these large basins and several smaller alluvial valley basins, groundwater in the region is generally scarce and limited by the condition of "bedrock aquifers," where groundwater is variable depending on local rock fracturing. Wells in fractured rock usually have a low capacity (less than 5 gallons per minute).

A description of the hydro-geology of the project area is presented in the groundwater section of Geology and Soils (Section 4.1), and the reader is referred to this section for additional information on groundwater occurrence and movement in areas of Franciscan complex bedrock. The following describes existing wells and springs near the project site.

West of Quarry

There are approximately 30-35 rural residential units within a two-mile radius of the quarry in the Ridgewood Subdivision to the west of the Harris Quarry, most of which depend on individual wells and several springs for their water supply. This is a water-short area. Nearly all of these residencies have wells drilled in hard rock and depend on water stored in rock fractures and replenished annually by rainfall fed groundwater recharge for their water supply. Most of the residents have water storage tanks, and many need to truck in water late in the summer and fall in drier than normal years to fill their storage tanks.

North of Quarry

A small commercial area occurs less than a quarter mile north of the quarry. The commercial area consists of a restaurant, a 30-unit motel, a residence, and several other small businesses. This area reportedly relies almost entirely on water supplied by a spring on land owned by Church of the Golden Rule located south of the quarry and east of Highway 101 (the Golden Rule Spring). The water supply line runs along the easterly quarry perimeter.

Further to the north and on the east side of Highway 101 is the California Department of Forestry and Fire Protection (now called CAL FIRE) headquarters. This is about one half mile from the quarry. This facility previously depended on springs owned by the project applicant for its water supply, but now obtains water from the City of Willits.

South of Quarry

Ridgewood Ranch, owned by the Church of the Golden Rule, is located immediately south of the quarry. The Church gets much of its water supply from springs in the hills east of Highway 101. The springs have been deemed "pristine water sources" by the State, which allows the Church to blend the various sources. These springs feed covered reservoirs, which deliver the water to the uses west of the highway. There are about 8 springs feeding two reservoirs.[58] There is also a moderately productive alluvial well to the east of Forsythe Creek on the ranch.

East of Quarry

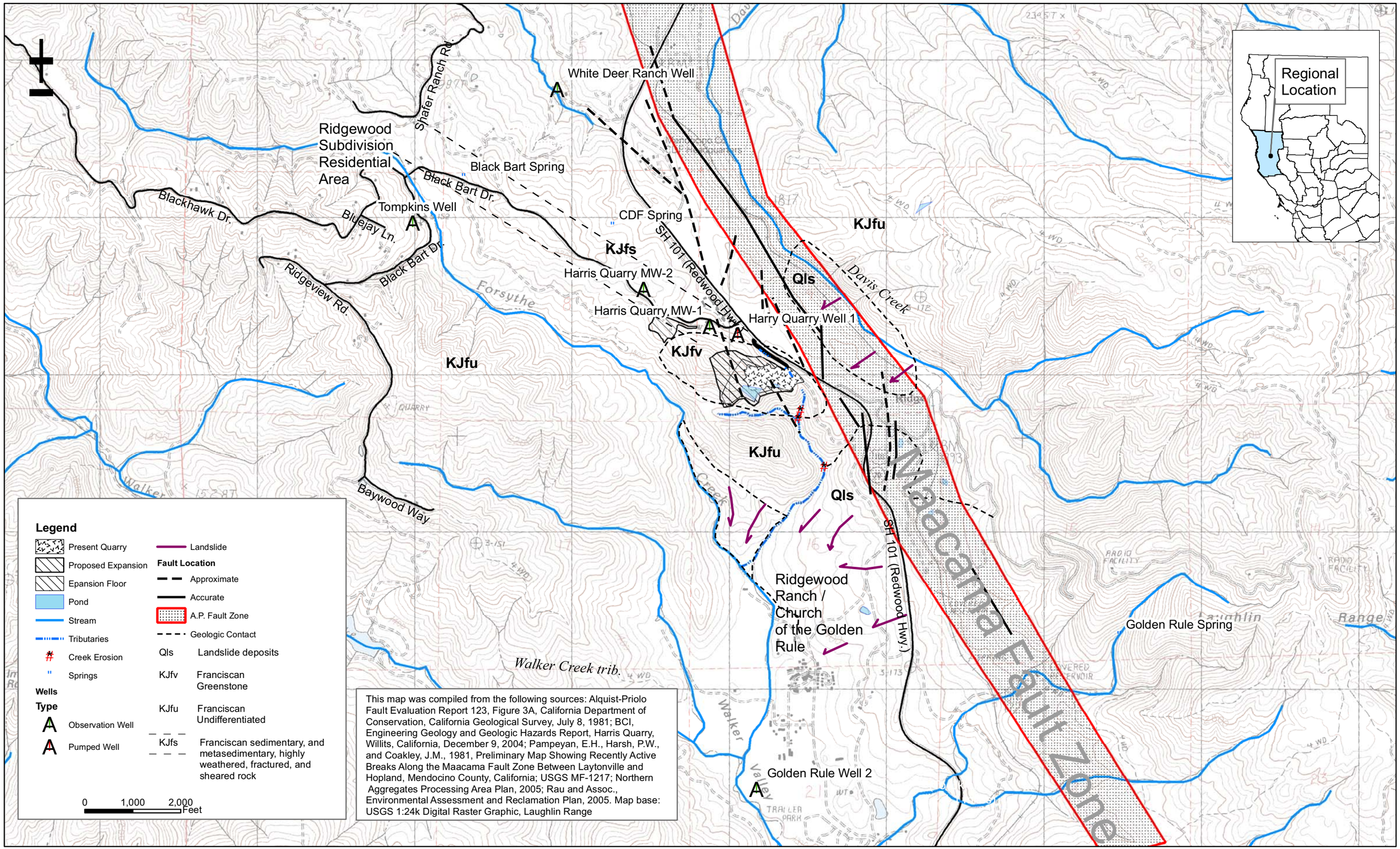
There is undeveloped land to the east of the quarry. This area is east of the Maacama fault and appears to be hydrologically un-connected to the quarry area.

b. Quarry Water Supply Influence on Wells and Springs

To investigate the potential impacts of increased quarry water demands from Well 1 and the CDF Spring on neighboring wells and springs, a seven-day aquifer test was conducted in September 2009 using Well 1 as the pumped well (Ludhorff & Scalmanini 2010). Five neighboring wells and three springs were monitored during the pump test. The 2009 test results were also compared with the results of a three-day pump test conducted by Rau & Associates in March 2007. The locations of wells and springs monitored during the September 2009 aquifer test are shown on Figure 4.2-2. As noted in the groundwater discussion of the Geology section of the DEIR, groundwater is largely confined to highly weathered zones and rock fractures, which often follow geologic structure, in areas of Franciscan rock.

The five test observation wells include two on-site and three off-site wells. Table 4.2-1 lists locations and details of all observation wells and springs. The closest observation wells are the two on-site quarry monitoring wells MW-1 (633 feet away from Well 1) and MW-2 (2,285 feet away from Well 1). These wells were originally designed as production wells, but no longer have pumps and are currently used as monitoring wells. The closest off-site well used as an observation well is the White Deer Ranch Well located about 1.2 miles northwest of Well 1. The well appears to be intended as a domestic but is not yet equipped with a pump. The well is located near a large pond, which was being pumped periodically for dust control for a nearby road construction project during the monitoring period. The Tompkins domestic well is located near Black Bart Drive about 1.4 miles northwest of Well 1. This is the only area near the quarry that contains a relatively high density of domestic wells. The Tompkins well contains a submersible pump but was unused during the monitoring period due to pump problems.

[58] Tracy Livingston, Church of the Golden Rule ranch manager, personal communication, 7/12/07.



PROJECT AREA HYDROLOGY AND GEOLOGY
Harris Quarry, Mendocino County, California

Figure 4.2-2

Table 4.2-1
Harris Quarry 2009 Aquifer Test Well and Spring Information

Well or Spring ID Drilled	Location[1]		Distance from Pumped Well (ft)	Elevation (ft msl)[2]	Well Depth (ft)	Screened Interval (ft)	Casing Diameter (ft)	Seal Depth (ft)	Pumping or Flow Rate (gpm)[3]	Date Drilled	Well Completion Report
	Northing	Easting									
Wells											
Harris Quarry Well 1	2,252,194	6,190,191	0	1,983.60	380?	100-140[4]	8	20	15	Jan-05	Yes
Harris Quarry MW-1	2,252,354	6,189,579	633	2,014.30	99	NA	5	NA	No Pump	NA	NA
Harris Quarry MW-2	2,253,242	6,188,160	2,285	2,155.90	148	NA	5	NA	No Pump	NA	NA
Whte Deer Ranch Well	2,257,378	6,186,413	6,415	1,756.30	224	NA	5 5/8	NA	No Pump	NA	NA
Tompkins Well	2,254,637	6,183,399	7,218	1,969.80	102	60-102	5	20	5 [5]	Dec-78	Yes
Golden Rule Well 2	2,242,629	6,190,335	9,566	1,210	50	24-50	10 3/4	15	No Pump	Sep-77	Yes
Springs											
CDF Spring	2,254,434	6,187,552	3,461	2,060					0.3		
Black Bart Spring	2,255,483	6,184,564	6,518	2,105					0.6 to 0.7		
Golden Rule Spring	2,245,803	6,197,984	10,078	2,200					24 to 28		

1. Horizontal datum = NAD83, California State Plane Zone 2. Most wells and springs surveyed by Rau & Assoc. 9/2/09 and 9/3/09. Golden Rule well surveyed by LSCE using handheld GPS. Golden Rule spring coordinates estimated from USGS topographic map.

2. Vertical datum = NAVD88. Wellhead elevations based on sounding port used for water level measurements. Golden Rule Well 2 elevation based on survey of Well 1. Golden Rule spring elevation estimated from USGS topographic map

3. Spring flow rates based on September-October 2009 measurements.

4. Open hole below 140 feet. Hole was drilled to 380 feet, but current well depth unknown.

5. Tompkins well pumping rate estimated at time of drilling.

The Church of the Golden Rule (CGR) owns three wells located on the Ridgewood Ranch in the Walker Valley just east of Forsythe Creek. Only one of these wells (Golden Rule Well 1) is currently active and used to irrigate adjacent fields. This well could not be monitored during the test because the wellhead did not have access for installation of a pressure transducer. As an alternative, an unused well located about 75 feet to the south was monitored during the test. This well was labeled Golden Rule Well 2 and is located about 1.8 miles south of Harris Quarry Well 1.

The three springs monitored during the test are also listed on Table 4.2-2. The two closest springs are located north of Black Bart Drive on quarry property northwest of Well 1. These are labeled the CDF Spring and the Black Bart Spring. The CDF Spring is located about 2/3 of a mile from Well 1; the Black Bart Spring is located about 1.2 miles from Well 1 on Black Bart Drive. As indicated above, the CDF Spring is used periodically by the quarry for dust control. The Black Bart Spring is used by nearby residents to fill water tanks.[59]

The third spring monitored during the test is the Golden Rule Spring owned by CGR. This spring is located on the Ridgewood Ranch on the east side of Highway 101 about 1.9 miles from Well 1 at an elevation of approximately 2,200 feet msl. The spring discharge flows into a 300,000 gallon covered reservoir and is used for water supply by

[59] In a June 15, 2005 letter to the Mendocino Planning and Building Services (MPBS), the Mendocino County Water Agency expressed concern that the quarry expansion could impact spring flow for users of neighboring springs.

CGR. The nearby businesses located north of the proposed project all use diverted spring water provided by the Golden Rule Spring.

It appears that the CDF and Black Bart Springs north of Black Bart Drive, in addition to the active wells within the quarry area, occur in a narrow band in a northwest-southeast alignment to the north of the quarry. This apparent geohydrologic trend roughly parallels Black Bart Drive on its north side and is shown on the geology map (Figure 4.2-2). The trend of this band follows a general ridgeline, although springs are located on both the northeast and southwest sides of the upper ridge. Further, the general trend of this spring and well band alignment parallels the trend of Forsythe Creek to the southwest. In addition to the springs that occur within the band of highly weathered and fractured rock to the immediate north of the quarry, several springs occur to the east, along the Maacama fault zone. Often creeks will erode (over geologic time) into rocks that are weakened and fractured along structural lines. This general northwest-southeast trend is consistent with the regional geologic structure, although it is somewhat oblique to the more northerly trend of the nearby Maacama Fault zone (see also geology section of DEIR for a more complete discussion of the geology of this area).

Available regional geologic mapping shows the general spring-well line orientation as occurring near the contact between undifferentiated Franciscan assemblage rock and Franciscan meta-volcanic rocks, but the scale of mapping of this sheet is too small to properly show the orientation and details of the contact.[60] The Ukiah sheet does not show the quarry area, including the trend of wells and springs, as being within a fault zone, nor does it show the Maacama fault zone, but this trend could represent either an unrecognized fault that has fractured and sheared the local rocks, creating similar opportunities for springs to issue forth, or it could conceivably represent a joint or rock fracture system that is connected over some distance. Pampeyan (1981) also does not show any structural trends or lineaments along this spring-well line band in his mapping of the Maacama fault, but a lineament with a similar trend is shown on the Maacama fault studies map along (just north of) lower Forsythe Creek to the south of the quarry area, and the fault maps show a trace of the fault with a similar trend just to the north of the quarry, west of the Mendocino County CAL FIRE Headquarters.[61] A spring also occurs along this lineament.

A detailed geologic map of the immediate quarry area that was prepared by BCI (Figure 3 of October 2004 BCI report) does show that the spring-well line band is within or near a zone of intensely weathered and fractured sandstone and meta-sedimentary rock, and geologic map symbols representing a fault or shear zone with a similar northwest-southeast orientation are also shown on this map.[62] According to the BCI report, shallow borings completed in the vicinity of this area indicate that some 15 feet or so of soil, colluvium and weak rock (shale and chert) are underlain at depths to at least the 80 feet explored by (harder) blue green rock, which was interpreted to be a metavolcanic rock or greenstone.

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[60] California Division of Mines and Geology, 1960, Geologic Map of California, Ukiah Sheet.

[61] Pampeyan, E.H., Harsh, P.W., and Coakley, J.M., 1981, Preliminary Map Showing Recently Active Breaks Along the Maacama Fault Zone Between Laytonville and Hopland, Mendocino County, California; USGS MF-1217.

[62] Blackburn Consulting, Inc. (BCI), 2004. Engineering Geology and Geohazards Report for Harris Quarry, Mendocino County, California.

Springs are also an important source of water for wildlife in an area where many creeks go dry in the late summer and fall. Potential quarry project impacts on springs are especially of concern in the Ridgewood Subdivision rural residential area, where some residents of this water-short area depend on the Black Bart Spring as a supplemental water source in an informal arrangement with the quarry property owner.

The geology of the area, including contacts of rocks with differing primary and secondary porosity, fractures and shear zones, are of interest, as any quarry operations that disrupt a potential "open pipe" rock fracture pattern that serves to carry groundwater laterally for some distance, could conceivably also disrupt the flow of water to springs upon which local residents depend. However, the springs could occur coincidentally within a zone of weathered and fractured near-surface rock and emerge at similar contacts with the underlying more dense, less weathered and fractured greenstone rock. If this is the case, then quarrying operations are less likely to impact springs or disrupt lateral groundwater movement.

Pump Test - September 2009

An aquifer test was conducted at the quarry in September 2009 to evaluate the impacts of Well 1 on surrounding wells and springs. The pumping phase of the test began on September 21, 2009 and ended on September 28. A total of 148,766 gallons of water was pumped to the storage tank during the test at an average rate of 14.9 gpm. Well 1 had a drawdown of 48.34 feet during the pump test, and displayed nearly full water level recovery 3 weeks after the pump test. As further discussed below, the results of the test conducted by Rau in March 2007 suggest that there is considerable seasonal variation in the response of Well 1 to pumping and the rate of recovery.

Drawdowns at the observation wells are shown in Table 4.2-2. Drawdowns of 0.05 to 0.29 foot were measured in three observation wells (MW-1, MW-2, and Golden Rule Well 2). The White Deer Ranch Well experienced both drawdown and recovery during the test, and the water level at the end of the test was essentially the same as at the beginning. The Tompkins well was the only well to experience water level increases throughout the monitoring period, including during the test. Four of the five observation wells experienced seasonal water level declines throughout the monitoring period, including pre- and post-pumping phases. An attempt was made to de-trend the water level data by calculating the overall slope of each water level hydrograph (depth to water vs. time) and adjusting the data by a constant value to remove as much of the slope as possible. This de-trending of drawdown data to take into account the seasonal declines shows no evidence of drawdown due to the pumping of Well 1. Thus, drawdowns measured during the test appear to be due to the seasonal decline rather than to pumping of Well 1.

Since the pumped well is deeper and has a well bottom lower in elevation than the observation wells, it could have effectively drained the adjacent observation wells and their small surrounding volume of water held in rock fractures, with slow or no recovery during this dry water year; however, this did not occur, indicating poor hydraulic connectivity of rock fractures. Thus, the test well and the nearby observation wells are likely not very well hydrologically interconnected through a shared and intercepted common rock fracture system within the spring-well band zone.

Table 4.2-2
Well Pump Test Results

Test Data	Pumped Well	Observation Wells				
	Harris Quarry Well 1	Harris Quarry MW-1	Harris Quarry MW-2	White Deer Ranch	Tompkins	Golden Rule Well 2
Dist. from Pumped Well (ft)	-	633	2,285	6,415	7,218	9,566
Start Date & Time	9/21/2009 12:46	-	-	-	-	-
Stop Date & Time	9/28/2009 11:20	-	-	-	-	-
Test Duration (days)	6.94	-	-	-	-	-
Total Pumped (gal)	148,766	-	-	-	-	-
Average Pumping Rate (gpm)	14.89	-	-	-	-	-
Depth to Water at Start of Pump Test (ft)	42.39	41.75	29.83	13.24	22.39	19.36
Depth to Water at End of Pump Test (ft)	90.73	42.04	29.9	13.23	22.1	19.41
Drawdown During Pump Test (ft)	48.34	0.29	0.07	-0.01	-0.29	0.05
Detrended Drawdown During Pump Test1 (ft)	-	-0.04	-0.08	-0.08	-0.16	-0.01
24-hr Specific Capacity (gpm/ft)	0.49	-	-	-	-	-
Residual Drawdown After 1 Week of Recovery (ft)	4.5	-0.83	-0.33	-0.24	0.06	-0.12
Residual Drawdown After 3 Weeks of Recovery (ft)	0.23	-1.86	-0.58	-0.2	0.35	-0.02

1. De-trending conducted by adjusting the water level data by a constant value to remove as much of the slope as possible. For Harris Quarry MW-1, a change in slope after 9/29/09 prevented de-trending of all data. De-trending of MW-1 was based on data from 9/03/09 to 9/28/09.

The three springs monitored during the pump test showed varying responses. The CDF Spring flow remained relatively constant at about 0.3 gpm during the monitoring period, with initial slight declines, but an eventual small increase in flow by the end of the test. Spring flow in the Black Bart Spring remained relatively constant at about 0.6 gpm during the month of September and showed a slightly increasing trend during the month of October. Ludhorff & Scalmanini concluded that short-term declines and other spring flow fluctuations during the test were probably unrelated to the pumping of Well 1. The Golden Rule Spring has a much higher flow rate (24 to 28 gpm) than the other two springs and accurate flow measurements were not obtained until shortly before the start of the pump test on September 21. The spring flow was about 27.5 gpm at the start of the test, and subsequently declined to 24.9 gpm by the end of the monitoring period on November 2. However, the Golden Rule spring is located almost two miles away from Well 1 on the opposite side of the Maacama Fault Zone, and since spring flow rates decreased at a relatively constant rate during the rest of the monitoring period for over one month after pumping was stopped, spring flow declines were likely seasonal in nature and were considered to be unrelated to the pumping of Quarry Well 1.

Simulations

In order to predict future pumping impacts, a single-layer analytical groundwater flow model based on the Theis (1935) equation was used to estimate the drawdown that would result from planned pumping to meet future water demands at the quarry. Aquifer

properties used in the model were a transmissivity of 530 gpd/feet based on the 2009 aquifer test results and an assumed storativity of 10^{-3} (Ludhorff & Scalmanini, 2010).

Well 1 was simulated as pumping at a rate of 12.1 gpm for a 120-day period, simulating proposed peak-season water demand over an extended period of time. Based on the model results, the five-foot drawdown contour is predicted to extend about ½ mile from Well 1 at the end of the peak operating season. Drawdowns outside this ½-mile radius are predicted to be less than five feet. There are no active domestic wells or mapped springs within the predicted five-foot drawdown contour.

Model results for a 20-week simulation period for projected weekly pumping cycles (6 days of continuous pumping and one day of recovery) show small residual drawdowns at the end of each pumping cycle. The simulated pumping rate during the majority of the season was 11.7 gpm. During the driest five weeks of the season (assumed to be early August through mid-September), a higher pumping rate of 13.3 gpm was used. The total predicted water level decline was about 16 feet at the end of the 20-week simulation. Full water level recovery would be expected during the off season.

8. Water Quality

a. Stormwater Runoff

Stormwater runoff pollutant sources at the quarry include loose decomposed rock (rock flour) and soil stockpiles, disturbed slopes, and vehicles and equipment storage and maintenance areas. Rock flour and soil can contribute silt and suspended solids to stormwater runoff. Vehicles and equipment can contribute diesel fuel, gasoline, motor oil, lubricants, hydraulic fluid, anti-freeze, and other similar pollutants to stormwater runoff. To prevent the transport of these pollutants to downstream waters, the quarry has developed a Storm Water Pollution Prevention Plan (SWPPP) and a Spill Prevention Control and Countermeasure Plan (SPCCP), in accordance with the requirements of their NPDES Industrial General Permit[63] (described in the section "Regulatory Framework" of this DEIR). The Spill Prevention Plan provides general information on the type and quantity of potential on-site spill sources, design and operating procedures, emergency response procedures, and inventory, facility maintenance, training, and fuel transfer information.

b. Existing Harris Quarry SWPPP Best Management Practices

Harris Quarry has developed a Storm Water Pollution Prevention Plan (SWPPP) that discusses the sources of sediment on the site and how the quarry currently utilizes Best Management Practices (BMPs) to mitigate some of the potential impacts of on- and off-site pollutant transport. These practices focus on retaining and/or filtering eroded sediments in runoff water, and place less emphasis on soil erosion control through establishment of adequate protective cover. The BMPs are both structural and non-structural in nature.

[63] State of California General Industrial Activities Storm Water Permit (Industrial General Permit), Water Quality Control Order No. 97-03-DWQ, adopted by the State Water Resources Control Board on April 17, 1997.

Existing Structural BMPs

The structural BMPs included in the current Harris Quarry SWPPP include site grading and berms to prevent stormwater from entering both of the Forsythe Creek tributaries. The existing sediment retention basin is designed to contain a 2-year 24-hour storm, while the larger quarry floor will contain a 100-year storm. Operations continue only when the quarry floor outside of the sedimentation pond is not inundated. The berm to the south is 2 feet to 6 feet high and prevents quarry by-products and erosion from entering the Forsythe Creek tributary below the quarry to the south. Berms also direct storage water to the existing sediment retention pond. Double walled fuel tanks and lines are in use, and the quarry grading serves to contain stormwater as well as any hazardous materials in the event of a spill.

Existing Non-structural BMPs

Non-structural BMPs include good housekeeping practices (e.g., using a vacuum truck to remove soil from the paved parking area), preventative maintenance of all structural control measures, a spill response plan, employee training in material handling and storage, as well as training in conducting stormwater visual observations, and completing data forms. Annual comprehensive site compliance evaluations are all documented. However, as previously noted, stormwater monitoring does not presently include sampling due to the distance and gradient at the location of the southerly culvert outfall and because the quarry stormwater is retained on site.

Other non-structural BMPs include quarrying excavation and construction practices such as the combing of ridgeline material toward the quarry basin to reduce side cast of boulders and sediment to adjacent fill slopes.

9. Regulatory Framework

Water resources are regulated by a variety of statutes at the local, State, and Federal levels. Agencies with regulatory and enforcement jurisdiction in Mendocino County include the County of Mendocino Department of Transportation, the North Coast Regional Water Quality Control Board (RWQCB), the State Water Resources Control Board (SWRCB), the California Department of Fish & Game, the Federal Emergency Management Agency (FEMA), the U.S. Army Corps of Engineers (Corps), and the U.S. Environmental Protection Agency (EPA). Plans, policies, and regulations pertaining to hydrology and water quality in the project area are outlined below.

a. Clean Water Act

Both State and Federal regulations govern the control of water quality in California. The Clean Water Act, as amended by the Water Quality Act of 1987, is the legislation governing water quality at a Federal level. The objective of the act is “to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Water quality regulation within California is based upon the State’s Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code). The CWA authorizes the EPA to implement water quality regulations. The EPA has delegated authority for water permitting to the California SWRCB. The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions

throughout the State, and has nine regional boards. The Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities; The North Coast Regional Water Quality Control Board (RWQCB, Region 1) regulates water quality in Mendocino County.

b. Water Quality Plan for the North Coast Region

The North Coast Regional Water Quality Control Board (RWQCB) has primary responsibility for the maintenance of water quality in the North Coast Region. The first comprehensive *Water Quality Plan for the North Coast Region* (Basin Plan) was adopted by the RWQCB in 1975. Since that time, the RWQCB has updated and amended the Basin Plan several times. The RWQCB adopted the most current version of the Basin Plan in September 2006. The Basin Plan is used by the RWQCB as a regulatory tool and by other agencies for permitting and resource management.

The RWQCB has the responsibility of protecting the beneficial uses of surface waters from pollution and nuisance that may be caused by waste dischargers. The goal of the Basin Plan is to define a program of actions that are designed to preserve and enhance water quality and to protect the beneficial uses of waters in the North Coast. Beneficial uses are identified in regional waters in order to assess which uses need to be protected from degraded water quality. From a water quality management standpoint, the most sensitive beneficial uses are municipal, domestic, and industrial water supply, recreation, and uses associated with the maintenance of resident and anadromous fisheries. The beneficial uses designated for Forsythe Creek, as recognized in the Basin Plan, are summarized in Table 4.2-3.

Additional water quality objectives are included in the Basin Plan, and have been developed with the intent of providing reasonable protection of identified beneficial uses and for nuisance prevention. These objectives apply to water in the Russian River hydrologic unit (HU), which includes Forsythe Creek and small drainages to it, such as the small drainage along the quarry entryway. Turbidity has not been monitored in runoff from or through Harris Quarry, but visual observations of water clarity during initial periods of runoff have included accounts of silty or cloudy runoff in the local drainage, specifically during the initial days of precipitation[64]. The Basin Plan allows a 20% maximum increase in turbidity above naturally occurring background levels, as measured at a downstream monitoring point. Allowable zones of dilution, within which higher percentages can be tolerated, may be defined for specific discharges upon the issuance of discharge permits or waiver.[65]

c. National Pollutant Discharge Elimination System (NPDES).

The National Pollutant Discharge Elimination System (NPDES) program under Section 402(p) of the CWA controls water pollution by regulating stormwater discharges into the waters of the U.S. California has an approved State NPDES program.

[64] Letter from Charles Martin, local resident, 2006.
[65] North Coast Regional Water Quality Control Board, 2006.

Table 4.2-3
Beneficial Uses of Forsythe Creek

HYDROLOGIC UNIT/AREA/SUBUNIT/DRAINAGE FEATURE 114.33 Forsythe Creek Hydrologic Subarea	
Beneficial Use Type	**Existing (E)/ Potential (P)**
Municipal and Domestic Supply (MUN)	E
Agricultural Water Supply (AGR)	E
Industrial Water Supply (IND)	E
Industrial Process Supply (PRO)	P
Groundwater Recharge (GWR)	E
Freshwater Replenishment to Surface Waters (FRSH)	-
Navigation (NAV)	-
Hydropower Generation (POW)	P
Wetland Habitat (WET)	E
Water Contact Recreation (REC-1)	E
Non-contact Water Recreation (REC-2)	E
Commercial and Sport Fishing (COMM)	E
Warm Freshwater Habitat (WARM)	E
Cold Freshwater Habitat (COLD)	E
Preservation of Areas of Special Biological Significance (ASBS)	-
Inland Saline Water Habitat (SAL)	-
Wildlife Habitat (WILD)	E
Rare, Threatened or Endangered Species (RARE)	E
Marine Habitat (MAR)	-
Migration of Aquatic Organisms (MIGR)	E
Spawning, Reproduction, and Development (SPWN)	E
Shellfish Harvesting (SHELL)	-
Estuarine Habitat (EST)	-
Aquaculture (AQUA)	P
Native American Cultural (CUL) beneficial use	-
Flood Peak Attenuation/Flood Water Storage (FLD)	-
Wetland Habitat (WET)	-
Water Quality Enhancement (WQE)	-

Source: North Coast Regional Water Quality Control Board, 2006.

The NPDES permit system was established in the CWA to regulate point source discharges. Point sources include a municipal or industrial discharge at a specific location or pipe. Nonpoint pollution sources are diffuse and originate over a wide area rather than from a definable point. Nonpoint pollution often enters receiving water in the form of surface runoff and is not conveyed by way of pipelines or discrete conveyances. As defined in the Federal regulations, such nonpoint sources are generally exempt from Federal NPDES permit program requirements. Urban stormwater runoff and construction

site runoff are diffuse sources regulated under the NPDES permit program because they are conveyed in a discrete system and discharge at a specific location(s).

For individual point source discharges, each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge; however, the project area would not be considered such an individual point source for NPDES permit purposes because the source of discharge is diffuse. For stormwater runoff, the NPDES program establishes a comprehensive stormwater quality program to manage urban stormwater and minimize pollution of the environment to the maximum extent practicable. The NPDES program consists of (1) characterizing receiving water quality, (2) identifying harmful constituents, (3) targeting potential sources of pollutants, and (4) implementing a comprehensive Stormwater Management Program. The EPA implemented the NPDES stormwater program in two phases. Phase I addressed large dischargers and construction activities that affect 5 acres or greater, while Phase II, which was implemented in 1999, adds smaller dischargers and construction activities that affect 1 or more acres.

Discharges of stormwater associated with industrial activity are regulated pursuant to Clean Water Act CWA section 402(p)(3)(A). This statute requires that permits for discharges associated with industrial activity must meet technology-based standards and water quality-based standards applicable to non-stormwater discharges. (CWA section 402(p)(3)(A). The applicable technology-based standards are that discharges of conventional pollutants achieve the best practicable control technology currently achievable (BCT) and that discharge of toxic pollutants achieve the best available technology economically achievable (BAT). (CWA section 301(b)(1)(A) and (2)(A). The applicable water quality based technology is that discharges must meet water quality standards. (CWA section 301(b)(1)(B).

To meet the goals of the NPDES permit, each local stormwater program and each permittee within a program establishes a Stormwater Management Plan (SWMP). These SWMPs provide specific local requirements targeted to meet the environmental needs of each watershed, as well as to reflect the political consensus of each community. The goal of the NPDES diffuse source (stormwater) regulations is to improve the quality of stormwater discharged to receiving waters to the “maximum extent practicable” (MEP)[66] through the use of best management practices (BMPs).

BMPs can include the development and implementation of various practices including educational measures (e.g., workshops informing the public of what impacts result when household chemicals are dumped into storm drains), regulatory measures (e.g., local authority of drainage facility design), public policy measures (e.g., label storm drain inlets as to impacts of dumping on receiving waters), and structural measures (e.g., filter strips, grass swales, and detention ponds).

[66] BMPs are intended to reduce impacts to the Maximum Extent Practicable (MEP), a general standard created by Congress to allow regulators the flexibility necessary to tailor programs to the site-specific nature of municipal stormwater discharges. Regulations do not define a single MEP standard, but reducing impacts to the MEP generally relies on BMPs that emphasize pollution prevention and source control, with additional structural controls as needed.

The proposed project would be subject to the NPDES permit system through the following NPDES permits:

- ***NPDES General Construction Activity Stormwater Permit (Construction General Permit).*** Pursuant to the CWA Section 402(p) and as related to the goals of the Porter-Cologne Water Quality Control Act, described below, the SWRCB has issued a statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Construction General Permit) (Order No. 2009 0009-DWQ, NPDES No. CAR000002), adopted September 2, 2009, in effect since July 1, 2010.

  Every construction project that disturbs one or more acres of land surface or that is part of a common plan of development or sale that disturbs more than one acre of land surface would require coverage under the Construction General Permit. To obtain coverage under the Construction General Permit, the landowner or other applicable entity must file Permit Registration Documents (PRDs) prior to the commencement of construction activity, which include a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other documents required by the Construction General Permit. Every regulated construction project, including those covered under the previous Construction General Permit (Water Quality Order No. 98-08-DWQ), are required to seek coverage under the newly adopted Construction General Permit.

- ***NPDES General Industrial Permit for Discharges of Storm Water Associated with Industrial Activities (Industrial General Permit).*** Pursuant to the CWA Section 402(p), the SWRCB has issued a statewide permit for certain types of industrial activities (Industrial General Permit) (Order No. 97-03-DWQ). A wide range of industries is covered under the Industrial General Permit, as determined by the facility Standard Industrial Classification (SIC) code, a four-digit code that refers to the type of business conducted. The Industrial General Permit regulates discharges from the quarry's mining operations.

  The Industrial General Permit requires control of pollutant discharges using Best Available Technology/Best Conventional Technology (BAT/BCT) to meet water quality standards. The requirements of the General Permit typically include, but are not limited to, the following:

  - Prepare and maintain a Storm Water Pollution Prevention Plan (SWPPP);
  - Develop and implement stormwater best management practices to minimize discharge of pollutants in runoff;
  - Conduct wet and dry weather inspections of the quarry on a regular basis;
  - Collect and analyze stormwater runoff at least twice per year from each discharge location; and
  - Prepare and submit annual reports on stormwater management activities.

  <u>Water Quality Benchmarks</u>

  NPDES permits for stormwater discharges must meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require control of pollutant discharges using BAT and BCT to prevent and reduce pollutants and any more

stringent controls necessary to meet water quality standards. The applicant shall reduce or prevent the discharge of pollutants in stormwater discharges and authorized non-stormwater discharges by developing and implementing BMPs that constitute compliance with BAT/BCT.

USEPA also established "benchmarks" which are the pollutant concentrations above which USEPA determined could be an indicator that the discharger has not effectively developed and implemented a SWPPP to reduce or eliminate pollutants in stormwater discharge to meet BAT/BCT. The benchmarks are generic and not intended to be numeric limits or protective of any particular receiving water. These limits can generally be viewed as representative of what is minimally achievable through a properly developed and implemented SWPPP designed to meet BAT/BCT.

Unless specific water quality goals or waste discharge limits are established for the quarry by the RWQCB, discharges shall not exceed water quality objectives outlined in the North Coast RWQCB Basin Plan. It is expected that the applicant will need to sample for the following benchmark constituents:

- pH,
- total suspended solids (TSS),
- specific conductance,
- oil and grease,
- total organic carbon,[67]
- turbidity, and
- TPH, total and dissolved iron, manganese, petroleum, and zinc.

The North Coast Basin Plan specifies other constituent levels in the Basin Plan, which may be incorporated into the Industrial General Permit.[68]

d. California Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (SMARA) addresses the State's need for mineral resources while preventing or minimizing negative public health, property, and environmental impacts of surface mining. The State Department of Conservation's Office of Mine Reclamation (OMR) and the State Mining and Geology Board (SMGB) are jointly charged with ensuring proper administration of the Act's requirements.

As related to hydrologic and water quality issues, the process of reclamation includes maintaining water quality, and minimizing flooding and erosion damage to wildlife and aquatic habitats caused by surface mining. The requirements of the SMARA apply to any surface mining operations that disturb more than one acre or remove more than 1,000 cubic yards of material.[69] Therefore, Harris Quarry, which would mine up to

[67] California Industrial Stormwater Effluent Worksheet, State Water Resources Control Board, Water Quality Order No. 97-03-DWQ.
[68] North Coast Regional Water Quality Control Board, 2006.
[69] California Department of Conservation, 2007. Office of Mine Reclamation. Surface Mining and Reclamation Act and Associated Regulations.

200,000 cubic yards of material per year, and disturb approximately up to 30 acres by the end of the 30-year permit, is subject to the requirements of SMARA.[70]

SMARA is implemented by city and county "lead agencies" who adopt ordinances for land use permitting and reclamation procedures, that in turn provide the regulatory framework under which local mining and reclamation activities are conducted. Mendocino County has adopted the SMARA in full via County Ordinance as described below.

e. Mendocino County Code

The following Mendocino County Code standards for Surface Mining and Reclamation apply to hydrology and groundwater resources related to the Harris Quarry study area.[71]

22.16 Surface Mining and Reclamation Standards

The County of Mendocino fully adopts the Surface Mining and Reclamation Act of 1975 and all the provision thereof. These provisions require that:

- Adverse environmental effects of surface mining operations are minimized, or, if possible, prevented, and that mined lands are reclaimed to a usable condition which is readily adaptable for appropriate alternative land uses;

- The production and conservation of minerals is encouraged, while giving consideration to values relating to recreation, watershed, wildlife, fisheries, range and forage, and aesthetic enjoyment;

- Residual hazards to the public health and safety are eliminated.

(Ord. No. 4031 (part), adopted 1999.)

Additional Sections, Sec. 22.16.060 through 22.16.080, address the permit requirements and reclamation standards pertaining to stormwater discharge, erosion, groundwater, water quality, enforcement and other standards.

The County's Stormwater Ordinance requires copies of the SWPPP be submitted to the Mendocino County Water Agency.

B. Potential Impacts and Mitigations

1. Criteria Used for Determining Impact Significance

Based on CEQA guidelines and other commonly accepted standards, a project would have significant hydrology and water quality impacts if it meets any of the following criteria:

[70] Yearly material extraction estimates from Northern Aggregates, 2004.
[71] Title 22 Mendocino County Land Usage Ordinance.

4.2a Violates any water quality standards or waste discharge requirements.

4.2b Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the groundwater table level (e.g., the production rate of pre-existing nearby wells or springs would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

4.2c Substantially alters the existing drainage pattern of the site or area, including through the alternation of the course of a stream or river in a manner which would result in substantial erosion or siltation on- or off-site.

4.2d Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increases the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

4.2e Creates or contributes runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff.

4.2f Substantially degrades water quality or results in additional siltation of either surface or groundwater.

4.2g Places housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood delineation map.

4.2h Places within a 100-year flood hazard area structures which would impede or redirect flood flows.

4.2i Exposes people or structures to significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

4.2j Is subject to inundation by seiche, tsunami, or mudflow.

4.2k Results in or requires the construction of new storm drain water facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

2. Project Impacts

The Initial Study prepared for the original DEIR determined that there would be no impacts for criteria 4.2g through 4.2j because the site is not within a 100-year floodplain or an area affected by dams, levees, seiche, tsunami, or mudflows. These significance criteria are not discussed further in this section.

Potential impacts addressed in this section include a) stormwater water quality and runoff volume effects from quarry expansion and b) groundwater and related water-supply effects of the proposed quarry operations.

The goal of the applicant's mining and reclamation plan is to contain all runoff within the quarry area and have no off-site runoff, except from the proposed processing area and the local haul and service roads. The water quality impact analysis focuses on whether there is adequate retention of all quarry runoff to minimize pollutants in waterways, and the proposed water quality treatment of runoff from the asphalt processing site and mining access roads. The surface water impact analysis focuses on providing independent verification of the ability of the plan to achieve a no net runoff goal from the quarry area, and separately, increased stormwater runoff consequences from the proposed processing area and roadway expansion. The groundwater section focuses on the potential impacts of increased use of the quarry's well on surrounding wells and springs, as well as the potential effects of quarry pit expansion and deepening on groundwater flow and recharge to neighboring wells and springs.

In preparing this section, the EIR geologists and hydrologists, Questa Engineering Corporation, conducted a peer review of all the applicant's submitted plans and technical reports related to surface water and groundwater. These reports were found to be professionally prepared and adequate for purposes of the EIR analysis with the addition of certain mitigation measures that are listed in the subsequent impact discussions.

Water Quality Impacts

Impact 4.2-A **Stormwater runoff containing sediments, metals, dust suppressants, total petroleum hydrocarbons, oil and grease, and other pollutants associated with mining activities and vehicle and equipment use would potentially violate water quality standards and/or impact habitat.**

The applicant has submitted a Notice of Intent to the North Coast Regional Water Quality Control Board stating compliance with National Pollutant Discharge Elimination System (NPDES) for industrial activities. For the proposed quarry expansion, the quarrying area stormwater would be retained on-site. The configuration of the proposed retention system would be such that even stormflow from 100-year, 24-hour events would be kept within the quarry basin and not be released to local slopes or drainages. The water balance would be maintained by adequate storage capacity during the winter months and evaporative and infiltration losses during the summer. Accumulated sediments would be removed from time to time to maintain retention storage capacity. The sedimentation/retention basin would be located near the center of the quarry floor, with all runoff on the floor directed to the quarry face and retention basin. There will be no work on the quarry floor during periods of inundation. Berms to the south and around the sump pond would continue to ensure no discharge of quarry stormwater to downstream channels. Erosion control planting would be done on the southerly berm.

At the asphalt processing site, constructed berms are proposed that would prevent off-slope drainage and direct stormwater over an asphalt pavement surface to a sediment

cleanout structure and a bio-retention area at the northwest end of the asphalt processing facility pad. Fill slopes will be vegetated and stabilized, and rock-lined v-ditches and trapezoidal swales will convey flow off-site and allow filtration of pollutants.

The proposed haul roadway will drain to natural slopes or to the newly culverted access road and the smaller north-south drainage. Runoff will be added to existing runoff from the Highway 101 culvert and pass through the quarry to be discharged to the southerly slope and tributary to Forsythe Creek.

The reclamation plan proposes to vegetate the upper slope, upper and lower benches, the floor of the quarry, and the entire asphalt processing facility site. Due to the layout of the quarry, reclamation is proposed to begin five years before the completion of rock removal, after the area to be mined will have been almost fully disturbed. However, pilot reclamation stages are proposed to span a period between 5 and 15 years after project approval. At the quarry site, 1.83 acres of slopes, 2.7 acres of benches and 18.1 acres of quarry floor will be reclaimed as open space. The quarry floor will be 25% grassland and 75% shrub oak woodland. At the asphalt processing site, 1.83 acres of slopes and 3.57 acres of processing pad will be reclaimed.

The initial pilot phases will include approximately 1 acre of slopes and a 0.25-acre planting bench located in the quarry site. The slopes on the asphalt processing site perimeter will also be planted during the pilot phases. The pilot reclamation bench plantings will test the vegetation response and cost-effectiveness of several different revegetation techniques.

Quantitative and qualitative monitoring and maintenance will be conducted to maximize establishment of vegetation, including irrigation, weed control, and plant protection.

There are three components of the proposed Harris Quarry expansion plan related to stormwater runoff: 1) the mining area expansion; 2) the new asphalt processing area, and 3) the roadway construction or expansion. The proposed project and the reclamation plan include practices and faculties aimed at managing stormwater. These are summarized below.

1 Mining Expansion

Currently, approximately 11.5 acres of the site drain to the quarry basin. Following future mining and after the proposed reclamation, the drainage area would be increased to roughly 30.6 acres. The design intent of the proposed mining area expansion is to have no stormwater runoff leave the site, with the entire quarry floor being used as a retention basin during the wet periods of the year. This stormwater management design is different from many other quarry operations where a detention basin is used. A *detention* basin is a topographic feature, either natural or man-made, where stormwater runoff is intercepted and detained for a finite period to reduce peak discharge volumes into downstream watercourses. Finer stormwater sediments and other pollutants (i.e., fine silts, clays, and hydrocarbons) would not usually settle out of small- or medium-sized standard detention pond or swale, and could potentially be transported downstream. A *retention* basin, as is proposed for Harris Quarry, is a landform where stormwater runoff is intercepted and retained indefinitely for evaporation and on-site percolation into the ground. For the proposed project, a sedimentation retention pond at the center of the

quarry floor has been verified as being more than adequate to hold the SMARA-required design level storm for a detention basin, while the 100-year 24-hour storms would be contained within the quarry limits.[72]

In the case of the proposed expansion of the quarry itself, because all the stormwater runoff is estimated to be retained on-site, as under existing conditions, the stormwater holding capacity, and not the settling time for sediments, is the appropriate design factor to consider. For the Environmental Assessment and Reclamation Plan, the sediment basin retention capacity was calculated by Rau Engineers using the SCS unit hydrograph method for a 10-year, 24-hour storm event; the quarry floor retention capacity was designed to hold at least a 100-year 24-hour storm event.[73] According to that analysis, the proposed sediment retention pond would hold the 10-year storm event and sediment storage for a full winter with a minimum of 3-foot of freeboard. For quarry floor retention, all quarry floors will be sloped 2% towards the retention pond; a structural berm 2- to 6-feet high installed along the southern rim of the quarry will prevent flows from leaving the quarry site. As designed, the proposed configuration of the quarry could contain more than seven consecutive 100-year storm events and still maintain 4 feet of freeboard to the rock overflow at the sump pond at the east end of the quarry that drains to the secondary channel of the Forsythe Creek tributary.

These applicant-furnished retention estimates do not factor in potential storage losses due to the presence of stockpiles or other sediment accumulations on the quarry floor, which if present, would reduce the effective capacity to retain stormwater. However, potential storage losses due to mining activities and storage on the quarry floor would be more than offset by the available freeboard and capacity in excess of the 100-year storm events.

Based on the excess capacity calculated for the quarry sediment retention basin, the proposed design and configuration of the quarry basin will retain even accumulated precipitation stormflow from very wet years. With the annual clearing of the retention pond and dredged sediment sold as aggregate product, quarry runoff represents a ***less-than-significant impact*** to water quality.

Total Petroleum Hydrocarbons

Total petroleum hydrocarbons (TPHs) that are used at the quarry include diesel fuel, gasoline, motor oil, and lubricants. The quarry contains numerous potential sources of accidental TPH release, including aboveground fuel storage tanks, vehicles, and equipment. Currently any deposits on roads enter the secondary channel of the Forsythe Creek tributary via the roadway drainage system. The project's management and practices may prevent the release of TPHs from the quarry itself; however, it is not currently possible to know if the pollutants from quarry access roads are being released into receiving waters at significant levels. Stormwater sampling at the quarry has not been conducted to date and has not included analysis of TPHs. It is planned that future road runoff will leave the paved roadway via storm drains and go directly to a new 290-foot long culvert system that will replace the existing open channel. The potential for contributions of petroleum hydrocarbons and other pollutants associated with trucks,

[72] Rau and Associates, 2011. Revised Project Description.
[73] Rau and Associates, 2010. Drainage Design Documentation for EIR Review. May.

machinery, and hauling quarry products will increase. The release of TPHs in stormwater discharge from the quarry roads represents a ***potentially significant impact.***

2. Processing Area

Creating the processing area pad would involve extensive site grading, including both hillside cut and fill slopes. The Yorktree, Hopland, and other soils in that area have high erosion (K) values. A slump, which is a form of mass wasting, was observed at this location.[74] Slope stabilization techniques are proposed to reduce risk of fill failure. The applicant's plan includes fill slope stabilization and hill slope erosion control measures, which were evaluated in Section 4.1 of this EIR.

On-site stormwater from most of the pad would be directed by site grading and a peripheral containment dike to the northwest, and treated by a system of structural best management practices before exiting the site. This part of the site would encompass the asphalt plant and truck cleanout area, a fueling area, and quarry product stock piles. Asphalt loading will be conducted on the processing pad, as well as asphalt oil storage and deliveries.

Drainage from the east cut slope of the pad would be conveyed via a grass-lined swale to the rock-lined spillway at the entrance to the quarry haul road, then to the existing drainage adjacent to Black Bart Drive.

The rest of the processing pad would be graded to drain to a sediment cleanout basin before it overflows to a bio-retention basin just outside the west boundary of the pad. The cleanout basin would allow settling of sediment before overflow into the bio-retention area. The cleanout basin would be dredged regularly to ensure adequate sediment retention volume, and 5-, 10- and 100-year overflow paths are incorporated into the cleanout basin. The peripheral containment dike at the boundaries of the processing pad would ensure no flow from the pad would run off-site. Grass-lined ditches are proposed to convey flow outside the processing area along the northern boundary of the site to a rock rip-rap spillway leading to the bio-retention basin. Rock spillways are proposed to prevent scour of the soil caused by concentrated, high velocity outflows from the processing area.

a. Fueling Area

The fueling area, located in the center of the processing pad, is proposed to have its own dedicated grading zone draining to a drain inlet with media filter, which would collect surface runoff, contain spills, and facilitate spill clean up. An overflow would release stormwater to the general processing area and eventually to the cleanout basin and bio-retention basin. The fueling area will be delineated by a drive-over curb that allows vehicle access while restricting inputs from stormwater from outside the fueling area.

[74] Blackburn Consulting, 2005.

b. Bio-retention Basin

The bio-retention basin is the largest of several proposed construction BMP measures for the processing area pad. The purpose of the bio-retention basin is to filter out sediment and chemical constituents that could impair water quality in Forsythe Creek, and to mitigate the concentration of flow from the processing area and any erosion, rilling, and gullying on the adjacent hill-slopes. This would be achieved by allowing stormwater to evenly infiltrate and pass through the basin before being released.

Bio-retention basins have been shown to remove pollutants such as phosphorus, metals (Cu, Zn, Pb), nitrogen (TKN), solids, organics, and bacteria at removal rates ranging from 68-98%.[75] In order to handle runoff effectively, a bio-retention basin must be appropriately sized for the area that it drains. Depending on the method used, sizing estimates can vary significantly.

The proposed bio-retention basin was sized according to Standard Urban Storm Water Mitigation Plan (SUSMP) guidelines outlining stormwater best management practices for new development.[76] The basin was designed per volume-based BMP and sized to filter pollutants from an 85th percentile average annual runoff volume. The basin was designed to capture and infiltrate or treat stormwater runoff equal to the maximized stormwater quality capture volume for the area, based on historical rainfall records, determined using the formula and volume capture coefficients set forth in Urban Runoff Quality Management (WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998)).[77] The proposed area for the bio-retention basin (as determined by the Caltrans Basin Sizer program and designed with a safety factor greater than "2") is approximately 5,000 square feet. The minimum media infiltration rate will be 5 inches per hour and drawdown time for the water quality volume will be 24 hours. As designed, the basin has the capacity for the 10-year storm with 1 foot of freeboard and the capacity for the 100-year storm with 6 inches of freeboard.

The bio-retention basin will be fed from the fueling area drain inlet and sediment cleanout basin by a 6-inch pipe. Once in the basin area, a 6-inch slotted pipe will disperse stormwater throughout the surface of the basin area. The basin will be filled with sandy loam media and an additional 1-2 feet of drain rock surrounding an 8-inch perforated pipe running along the bottom of the basin that eventually conveys flow to a 12-inch outlet pipe that outfalls to a rock energy dissipater on the hillslope roughly 1,500 feet from Forsythe Creek. A standpipe connects directly to the 12-inch outlet pipe to allow 100-year flows to discharge from the basin. An impermeable liner will be installed along the basin bottom to prevent basin seepage.

The bio-retention basin for the larger asphalt processing site drainage area has been designed per volume-based BMP and sized to filter pollutants from an 85th percentile

[75] The California Stormwater Quality Association (CASQA), January 2003. California Stormwater BMP Handbook. Bioretention. TC-32.
[76] Sonoma County et al., Guidelines for Standard Urban Storm Water Mitigation Plan, Storm Water Best Management Practices for New Development and Redevelopment for the Santa Rosa and Unincorporated Areas around Petaluma and Sonoma, June 3, 2005.
[77] California Stormwater Quality Association (CASQA), January 2003. New Development and Redevelopment California Stormwater BMP Handbook, pg. 5-15.

average annual runoff volume. The basin was designed to capture and infiltrate or treat stormwater runoff equal to the maximized stormwater quality capture volume for the area, with freeboard for the 10- and 100-year storms. This design has been reviewed by Questa Engineering Corporation and was found to be adequate given water quality and erosion control measures listed subsequently under Mitigation Measures for this impact.

c. Total Petroleum Hydrocarbons

Total petroleum hydrocarbons (TPHs) that would be used at the processing area include diesel fuel, bio-diesel (wash), gasoline, motor oil, lubricants, and asphalt oil. The processing area contains numerous potential sources of accidental TPH release, including aboveground fuel storage tanks, vehicles, and equipment. TPH accumulations in the processing area would enter the sediment clean-out basin, a common sump for the fueling area, and the bio-retention basin. However, the potential for contributions of petroleum hydrocarbons and other pollutants associated with trucks, machinery, and the hauling of quarry products will increase within the ingress and egress to the asphalt processing site, and would potentially contribute increased road or parking lot TPH accumulations to the vegetated area south of Black Bart Drive and the Black Bart Drive drainage system. The release of TPHs in stormwater discharge from the proposed processing area represents a ***potentially significant impact***.

3. Roadway Expansion and Construction

The quarry access road expansion, the haul road, and the new road to the water tank would result in increased runoff and transport of associated pollutants to the secondary channel of the Forsythe Creek tributary. Although background stormwater pollution may be attributed to runoff from Highway 101, additional runoff and pollution inputs may be significant, considering the increased transport of aggregate and asphalt, and the associated potential for spillage problems. With the widening of Highway 101 and construction of the haul road and water tank access road, impervious areas will increase by 2.6 acres, or, roughly 4% of the existing drainage area to the roadway system, which outfalls to the secondary channel of the Forsythe Creek tributary.

For the proposed section of the haul road between the quarry and the asphalt processing sites, the new paved road will be crowned such that flow from the north half of the road will drain to Black Bart Drive, and flow from the south half of the road will drain to drainage ditches on the uphill side of the road. The ditches will also convey runoff from upslope of the road, and stormwater will be diverted to two culverts. The first culvert is planned to convey stormwater below the haul road to Black Bart Drive approximately 600 feet before the intersection with Highway 101. The second culvert will distribute stormwater via an 80-foot slotted pipe dissipater to the existing wetlands just south of Black Bart Drive approximately 150 feet before the intersection with Highway 101. Stormwater from the remaining 500 feet of haul road before the intersection with the proposed entrance to the quarry site will be diverted to a rock-lined ditch that enters the culverted stormwater system below the access road.

The access road portion from the quarry entrance to the quarry site is crowned to drain into ditches lining both sides of the road. Flow from these ditches will be diverted to drain inlets of the proposed culverted stormwater system to the existing sump pond before outfall to the secondary channel of Forsythe Creek tributary. The conveyance of a

majority of stormwater into hillslopes or grass- or rock-lined drainage ditches will diminish the effects of potential polluted stormflow from paved road contributions, but some portion of the runoff from the newly paved quarry access road would drain directly to the newly installed culverts. The additional unattenuated flow and potential polluted stormflow from paved road contributions represents a ***potentially significant impact.***

No final drainage system has been developed for the new access road to the water tank. It is expected that at least part of the runoff from the slope above the road will be transported via ditch to the haul road and much of the runoff from the road spread and directed to slopes below the road. The additional unattenuated flow and potential polluted stormflow from this road represents a ***potentially significant impact.***

Conclusions

While quarry and asphalt processing site runoff represent less-than-significant impacts to water quality, the potential for increased release of TPHs and other pollutants in stormwater discharge from the asphalt processing site and increased paved and unpaved roadway areas represents a ***potentially significant impact.***

Mitigation Measures

The following mitigation measures are designed to ensure that the proposed expansion project will not discharge more suspended solids or other pollutants than the existing quarry does. This will be achieved by requiring that the applicant comply with all pertinent NPDES permits and revise the Stormwater Pollution Prevention Plan (SWPPP) with more detailed, rigorous and comprehensive details including preventative measures and performance objectives to prevent any erosion and sources of pollution for the proposed project. Many of these mitigation measures are based on implementation of current best management practices for controlling erosion and sedimentation and removing pollutants from stormwater. The mitigation measures shall be applied during quarrying operations and during quarry closures due to storm events.

4.2-A.1 The project shall comply with the RWQCB's Construction General Permit conditions.

As stated in the Setting section, construction of quarry expansion elements include clearing, grading, and disturbances to the ground, such as stockpiling or excavation, that result in soil disturbances of at least one acre of total land area will be subject to the Construction General Permit. The Stormwater Pollution Prevention Plan (SWPPP) required under this permit has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of stormwater discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges.

Runoff discharges from construction sites may become contaminated with sediment and alkaline materials as a result of the construction activities. The Construction General Permit requires effluent monitoring and sets action levels and effluent limitations to assess BMP performance and determine permit compliance:

- Technology-based Numeric Action Levels (NALs). The Construction General Permit includes NALs for pH and turbidity for Risk Level 2 and 3 projects. The NALs for pH and turbidity are not directly enforceable and do not constitute effluent limitations:
  - pH 6.5-8.5
  - turbidity 250 NTU
- Technology-Based Numeric Effluent Limitations (NELs). The Construction General Permit contains NELs for pH during any construction phase where there is a high risk of pH discharge and turbidity for all discharges in Risk Level 3. Exceeding a NEL is considered a permit violation and is directly enforceable:
  - pH 6.0-9.0
  - turbidity 500 NTU

Components of the Construction General Permit include:

- Rainfall Erosivity Waiver. The Construction General Permit allows those overseeing construction on a small site (between 1 and 5 acres) to self-certify if the rainfall erosivity value (R value) for the site, given the construction time frame, is less than or equal to 5.
- Risk-Based Permitting Approach. The Construction General Permit establishes three levels of risk possible for a construction site. Risk is calculated in two parts: 1) Project Sediment Risk, and 2) Receiving Water Risk.
- Minimum Requirements Specified. The Construction General Permit specifies more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.
- Project Site Soil Characteristics Monitoring and Reporting. The Construction General Permit provides the option for dischargers to monitor and report the soil characteristics at their project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.
- Effluent Monitoring and Reporting. The Construction General Permit requires effluent monitoring and reporting for pH and turbidity in stormwater discharges. The purpose of this monitoring is to be used to determine compliance with the NELs and evaluate whether NALs included in this General Permit are exceeded.
- Receiving Water Monitoring and Reporting. The Construction General Permit requires some Risk Level 3 dischargers to monitor receiving waters and conduct bioassessments.
- Post-Construction Stormwater Performance Standards. The Construction General Permit specifies runoff reduction requirements for all sites not covered by a Municipal General NPDES permit, to avoid, minimize, and/or mitigate post-construction stormwater runoff impacts.
- Rain Event Action Plan. The Construction General Permit requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.

- Annual Reporting. The Construction General Permit requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and public information.
- Certification/Training Requirements for Key Project Personnel. The Construction General Permit requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.
- Linear Underground/Overhead Projects. The Construction General Permit includes requirements for all Linear Underground/Overhead Projects (LUPs).

There are three levels of risk: Risk Level 1 projects are subject to minimum BMP and visual monitoring requirements; Risk Level 2 projects are subject to NALs and some additional monitoring requirements; and Risk Level 3 projects are subject to NELs and more rigorous monitoring requirements, such as receiving water monitoring and in some cases bioassessment.

Risk levels are based on a matrix of project sediment risk and receiving water risk. Sediment risk is based on estimated soil loss, as calculated by the Revised Universal Soil Loss Equation (RUSLE). Receiving water risk is based on whether a project drains to a sediment-sensitive waterbody. A sediment-sensitive waterbody is either on the most recent 303(d) list for waterbodies impaired for sediment; has a US EPA-approved TMDL implementation plan for sediment; or has the beneficial uses of cold freshwater habitat, fish spawning, and fish migration. Discharge to a sediment-sensitive waterbody is automatically a Risk Level 2 or greater.

The larger Forsythe Creek Hydrologic Sub Area is listed on the 2006 303(d) list as impaired by sediment, and Forsythe Creek itself has beneficial uses of cold freshwater habitat, fish spawning, and fish migration (Table 4.2-3). Therefore, depending upon the erosivity of project site soils, the proposed project could be categorized as either a Risk Level 2 or 3 project.

Specific recommendations that will be required for compliance with this permit are included in subsequent mitigations.

4.2-A.2 The applicant shall not cause or contribute to a violation of an applicable water quality standard. The applicant shall comply with the NPDES Permit Requirements for the Industrial General Permit (Order No. 97-03-DWQ).

Long-term operation of the quarry post-construction will be subject to the Industrial General Permit. To meet this standard, the applicant shall comply with the Industrial General Permit as set forth by the North Coast Regional Water Quality Control Board (RWQCB).

Since 1997, Harris Quarry has not been required to collect stormwater runoff from discharge locations. The rationale for the exemption includes the risk associated with accessing and sampling the southeasterly culvert outlet to the secondary channel of the Forsythe Creek tributary, and the fact that the quarry area stormwater is retained on-site in the quarry basin, while the incoming drainages are relatively isolated from quarry area inputs. Monitoring is currently done only on a visual basis from upslope.

However, with the construction of the new paved haul road between the quarry expansion area and the proposed processing area and the road to the water tank, sampling of stormwater discharges from both the quarry expansion and asphalt processing areas shall be required. The specific elements of this mitigation measure are:

Water Quality Monitoring and Sampling

The applicant shall develop and implement a facility-specific monitoring program to provide indicator monitoring information for the following: (1) BMPs addressing pollutants in stormwater discharges and authorized non-stormwater discharges comply with the Discharge Prohibitions, Effluent Limitations, and Receiving Water Limitations of this General Permit, (2) the presence of pollutants (and their sources) in stormwater discharges and authorized non-stormwater discharges that may require immediate corrective action, additional BMP implementation, or SWPPP revisions, and (3) the effectiveness of BMPs to prevent or reduce pollutants in stormwater discharges and authorized non-stormwater discharges.

The applicant shall be required to:

1. Collect and analyze stormwater samples from the first two qualifying storm events of the wet season. Analysis must include: (a) the minimum indicator parameters: pH, total suspended solids (TSS), total organic carbon (TOC) or Oil and Grease, and specific conductance, (b) parameters that indicate the presence of materials that are mobilized by contact with stormwater (such as rock salt) and are likely to be exposed to stormwater (based upon the discharger's pollutant source assessment required in the SWPPP), (c) parameters listed in Table VIII "Additional Analytical Parameters" (these parameters are dependent on the facility's SIC code), and (d) parameters indicating the presence of industrial materials that may be causing or contributing to an exceedance of a water quality standard in the receiving waters. Water sampling shall be conducted by a third-party consultant and water samples shall be submitted to a California-certified analytical laboratory for analysis.

2. Visually observe the facility before every anticipated storm event to locate and manage obvious pollutant sources.

The Industrial General Permit requires dischargers to collect samples from all drainage areas. The following actions are required:

1. Facility operators shall visually observe and collect samples of stormwater discharges from all project drainage areas. The samples shall represent the quality and quantity of the facility's stormwater discharges from the storm event.

2. If the facility's stormwater discharges are commingled with run-on from surrounding areas, the facility operator shall identify other visual observation and sample collection locations where project discharges have not been commingled by run-on and that represent the quality and quantity of the facility's stormwater discharges from the storm event.

3. If visual observation is not possible or sample collection locations are difficult to sample (e.g., sheet flow, submerged outfalls), facility operators shall identify and collect samples from other locations that represent the quality and quantity of the facility's stormwater discharges from the storm event.

4. If facility operators determine that the industrial activities and BMPs within two or more drainage areas are substantially identical, they may either (i) collect samples from a reduced number of substantially identical drainage areas, or (ii) collect samples from each substantially identical drainage area and analyze a combined sample from each of these drainage area. Facility operators must document such a determination in the annual report.

Sample collection sites shall include, at a minimum:

1. Due to the steep slope and associated inaccessibility for sampling at the existing 36-inch CMP outfall from the existing sump pond at the southeast corner of the quarry site, another point upstream shall be used for sampling. This location shall be the outlet of the proposed 48-inch pipe entering the sump pond, or sampling can be conducted via installation of a vertical CMP clean-out in the proposed 48-inch pipe within the quarry site.

2. Outfall of the proposed 12-inch pipe outlet for the bio-retention area at the asphalt processing site.

All associated records of stormwater quality monitoring, sampling, and analyses shall be retained and submitted per RWQCB permit requirements. The applicant shall submit a monitoring report to the RWQCB with a copy submitted to the County Department of Planning and Building Services. Frequency of reporting shall be determined by the RWQCB but shall not be less frequent than twice each rainy season. The qualified water quality professional conducting the monitoring shall provide an analysis of the data and an evaluation of the overall effectiveness of the sediment control system. If the water quality objectives have been exceeded, the report shall include analysis as to the specific causes of the exceedances and recommended measures to bring the discharges into compliance.

The General Permit requires facility operators to reduce or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the development and implementation of BMPs which constitutes compliance with BAT and BCT and, in most cases, compliance with water quality standards. If receiving water quality standards are exceeded, the applicant will be required to submit a written report providing additional BMPs that will be implemented to achieve water quality standards.

4.2-A.3 If necessary, implement corrective measures to meet water quality objectives. Once mining commences, if annual surface water monitoring indicates that discharges from the quarry exceed the water quality objectives, the applicant shall propose changes to the sediment control program that will improve its performance sufficiently to meet the performance criteria. Corrective action may include, but is not limited to, implementation of additional source control BMPs, use of chemical flocculation, installation of mechanical filtration of the discharge, and/or construction of extended wet ponds and/or treatment wetlands. The proposed changes shall be submitted to the RWQCB for comment, revised as needed to address their comments, and then implemented by the applicant. If the performance criteria are not met for two consecutive years, the County Department of Planning and Building Services will confer with the applicant and the RWQCB to determine whether further changes in the sediment control plan are likely to result in compliance. If suitable changes are not identified, then the County shall require the quarry to reduce production as needed to meet the performance criteria.

4.2-A.4 The applicant shall revise and implement an updated Storm Water Pollution Prevention Plan (SWPPP) for the project. The erosion control portion of the SWPPP shall include an aggressive sediment source and delivery control program. It shall place greater emphasis on establishing temporary and permanent protection of disturbed fill slopes and drainages in the processing areas that drain to Forsythe Creek. Most importantly the plan must include an annual winterization report that documents the location and application of best management practices to mitigate reduction in water quality due to sediment in storm runoff. The SWPPP shall be regularly updated as BMPs are updated and new BMPs are constructed and/or the quarry operation changes. The SWPPP shall be implemented during the initial stage of quarry construction and stay in effect through the completion of reclamation.

The required detailed SWPPP, including the erosion control plan shall also include:

1. A formal plan for preventing the inadvertent side cast of materials from the quarrying area entering Forsythe Creek and its tributary shall be developed.

2. All fill slopes draining to Forsythe Creek shall be stabilized prior to October 15 of each year. The plan shall include a detailed design plan for annual stabilization. Stabilization measures include fill slopes suitable for hydraulic application of surface stabilizing compounds, hydroseeding, mulching, or other measures to prevent erosion, and the application

thereof. It shall include a description of the erosion control materials to be used and application rates. Seed mixes shall be specified. A schedule for completion of stabilization shall be included, and the stabilization shall be completed by October 15 each year.

3. Silt fences, fiber rolls, and straw bale barriers shall be used on bare slopes not being actively mined to intercept and trap sediment carried by sheet flow.

4. The site plan shall show work areas, indicating the year the initial reclamation occurred, active mining, stockpiling, work areas, and areas to be mined the following year.

5. The site plan shall show erosion and drainage problem areas, and proposed emergency stormwater runoff flow directions, in addition to the planned retention, bio-retention, and treatment areas.

6. The applicant shall place all hazardous materials and fueling areas above predicted 100-year 24-hour flood elevations and above observed seasonal high-water elevations.

7. A plan to annually monitor and treat stormwater outlets that discharge to slopes and drainages to insure that gullying, incision, or other erosion and mass wasting processes are not occurring as a result of project area operations and site drainage will be implemented.

4.2-A.5 During mining and reclamation activities, the following measures shall be included in the SWPPP required under the General Construction Permit and implemented to reduce the potential for erosion and sediment discharge:

1. Topsoil suitable for use in revegetation shall be stockpiled in a stable manner 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. Topsoil shall be stored in locations that are not immediately above or adjacent to stream drainages.
2. Benches shall drain into adequately sized pipes or rock-lined channels that convey the runoff to the quarry floor. Outlets of pipes shall have appropriate energy dissipaters to prevent erosion at the outfall.

4.2-A.6 The applicant shall implement best management practices to reduce the potential for discharge of contaminants to stormwater runoff. These BMPs shall be included in the General Construction Permit SWPPP and shall be designed by a civil engineer, and the design engineer shall oversee BMP installation. To minimize the introduction of contaminants, which may degrade the quality of water discharged from the site, the following measures shall be taken:

- Runoff from all access roads shall be collected and passed through a treatment swale or trap system prior to entering the existing or planned drainage features for the highway improvements that outfall to the secondary channel of the Forsythe Creek tributary. Ditch flow shall not exceed 100 feet of concentrated flow.
- 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 releases of hazardous material. 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.
- All chemical dust suppressants, slope stabilization chemicals or polymers, and sediment detention basin enhancement chemicals or polymers shall be used strictly according to the manufacturer's specifications. An accurate accounting of all these materials purchased and used on the site shall be maintained, including kinds and quantities of material.

Impact Significance After Mitigation

The mitigation measures provide an appropriate method for treating runoff from the quarry to the adjacent tributary in case of a record wet year and unforeseen conditions on the quarry. The mitigation measures also require that the runoff from the site, including the asphalt processing facility and roads, meet or exceed the water quality benchmark criteria for the life of the project. Stormwater runoff from the processing area will not be allowed to increase sedimentation or any other water quality criterion in the stormwater runoff. The recommended measures would ensure that impacts to water quality per the Basin Plan for the North Coast Region would be reduced to a less-than-significant level. The mitigation measures ensure ongoing monitoring best management practices and provide appropriate discretion to the RWQCB to require additional monitoring, erosion control devices, and practices, or, if compliance cannot be reached, to reduce quarry operations. The recommended measures would reduce the impact to water quality to a ***less-than-significant*** level.

Changes to Runoff Patterns

Impact 4.2-B Quarry expansion and use will alter the runoff regime to Forsythe Creek.

Under existing conditions, the quarry site proper retains all runoff from the quarry slope faces and floor within the boundaries of the active quarry mining area, where stormwater is retained within an existing retention basin. The existing configuration of the quarry floor allows retention of the 100-year 24-hour storm without discharging to slopes or drainage channels off the site. Stormwater runoff from hill slopes north of the quarry site drain to Black Bart Drive and is conveyed east to the Highway 101 culvert system. The existing quarry access road drains to an open channel where it combines with the runoff from Highway 101 culverts. The runoff is conveyed to a sump pond on the southeast

corner of the quarry before being diverted to a 36-inch outfall pipe to the secondary channel of the Forsythe Creek tributary. The south-facing slopes below the southern rim of the quarry drain directly to the Forsythe Creek tributary.

Under proposed conditions, the quarry site drainage area will expand from 11.5 to 30.6 acres, and will continue to retain all stormwater runoff from this area within the active quarry boundaries. This quarry expansion will decrease contributing drainage areas from the quarry property to the 36-inch sump pond outfall. Quarry expansion will also decrease contributing drainage areas from the south-facing slopes below the quarry to the Forsythe Creek tributary.

While the active quarry expansion area and proposed haul roads will drain to the Forsythe Creek tributary, the majority of the asphalt processing site will drain directly to Forsythe Creek. Table 4.2-4 shows the existing and proposed contributing drainage areas.

Table 4.2-4
Existing and Proposed Contributing Drainage Areas

Watershed	Contributory Features	Drainage Area Outfall	Area (acres)	
			Existing	Proposed
Forsythe Creek Tributary Drainage	Roadway Drainage (Black Bart Drive, Highway 101, Quarry Access Roads)	Sump Pond 36-inch Pipe	71.1	62.9
	Active Quarry Mining Area	Quarry Floor Retention	11.5	30.6
	South of Quarry	Forsythe Creek tributary	39.8	28.9
		Total	122.4	122.4
Forsythe Creek	Asphalt Processing Site and Quarry Property Drainage West of Quarry Site	Length of Forsythe Creek	57.7	57.7

At the asphalt processing site, runoff does increase due to the 3.5 acres of paved surface proposed to drain to the bio-retention basin. This represents a 5.6% increase in impervious area contributing to runoff to Forsythe Creek. Table 4.2-5 shows existing and proposed peak flow runoff rates for both drainage areas.

The Rational Method was used to estimate peak discharge (runoff) from the project site and watershed for existing and proposed conditions. The peak discharge was estimated for the 10- and 100-year design storms. The rainfall intensity was based upon the rainfall intensity/duration curve equations by the Department of Water Resources for the City of Willits, California.[78] The contributing watershed area was divided into several

[78] City of Willits, Standard Plans No. 416, October 2009.

Table 4.2-5
Existing and Proposed Peak Flow Rates

Quarry Expansion Subbasin	Contributory Features	Drainage Area Outfall	Discharge (cfs)							
			10-year Event				100-year Event			
			Existing	Proposed*	% Change		Existing	Proposed*	% Change	
Forsythe Creek Tributary Drainage	Roadway Drainage (Black Bart Drive, Highway 101, Quarry Access Roads)	Sump Pond 36-inch Pipe	44.9	43.8	2.4	Decrease	67.2	58.1	13.5	Decrease
	South of Quarry	Forsythe Creek main trib channel upstream of 2nd channel	26.8	19.1	28.7	Decrease	39.7	28.4	28.5	Decrease
	Total at confluence with main creek		**103.57**	**94.77**	**8.5**	**Decrease**	**183.87**	**163.47**	**11.1**	**Decrease**
Forsythe Creek	Asphalt Processing Site	Bioretention Basin	1.96	4.2	114.3	Increase	3	6.1	103.3	Increase
	Quarry Property Drainage West of Quarry Site	0.7 miles upstream of confluence with tributary	30.1	30.1	0.0	No Change	44.5	44.5	0.0	No Change
	Total at confluence with tributary		**342.26**	**344.5**	**0.7**	**Increase**	**607.6**	**610.7**	**0.5**	**Increase**

* The proposed peak runoff rates for the quarry sump pond 36-inch pipe outfall and Asphalt Processing Site bio-retention basin were taken from Rau and Associates drainage analyses (2010) of the highway improvements (TR-55) and water quality volume analysis of the bio-retention basin.

smaller drainage areas for a more accurate estimate of runoff. The following summarizes the changes in runoff to the tributary, the main creek above the drainage from the quarry, and the main creek below the quarry.

With the addition of the proposed asphalt processing site, downstream peak flows in Forsythe Creek, upstream of the confluence with the tributary draining the quarry site, will increase by 0.7% during the 10-year storm event, and by 0.5% during the 100-year storm event.

With the proposed quarry expansion, peak flows in the 1,600-foot long Forsythe Creek tributary south of the quarry will decrease by 8.5% during the 10-year storm event, and by 11% during the 100-year storm event. However, the quarry basin lies on medium to highly fractured bedrock and because the quarry will act as a retention basin, infiltration and fracture flow from the quarry could potentially increase during the wet periods of the year, and a portion of the water captured by the basin would eventually be returned via groundwater flow to the Forsythe Creek tributary. Also, the existing secondary channel to the Forsythe Creek tributary was originally formed or enlarged due to the diversion of Highway 101 runoff. This channel is experiencing gullying and erosion, and a decrease in runoff to this channel may decrease the rates of active incision.

The entire proposed project watershed represents 7% of the larger 2.7-square mile Upper Forsythe Creek drainage area. There would be a net decrease in flows to Forsythe Creek below the confluence with the tributary draining the quarry of 1.6% for the 10-year event, and 2.2% for the 100-year event (see Table 4.2-6).

Table 4.2-6
Existing and Proposed Project Peak Flow Rates for the Upper Forsythe Creek Drainage Area

Storm frequency	Peak Discharge, Q (cfs)		Percent Decrease
	Existing condition*	Post-reclamation	
10-year	445	438	1.57
100-year	790.00	773	2.15

*Existing flow rates were scaled down by area from FEMA Flood Insurance Study[79] flow rates for
Forsythe Creek at its confluence with Mill Creek (watershed area 18.7 sq. miles).

The change in discharge is of a magnitude that would not affect the receiving channels or flows in the creek. In addition, it is expected that the reduction in flows would be less than reported here due to some infiltration of water stored on the quarry floor to the stream. The changes in runoff would have a ***less-than-significant impact*** on downstream flows in Forsythe Creek. In addition, as is discussed further in the subsequent section on Biological Resources, the percentage reduction in streamflow at the point downstream where salmonids inhabit Forsythe Creek would be less than described above because there would be a larger watershed contributing runoff to the stream at this point.

On a smaller scale, flows from the new, paved 3.5-acre processing pad will leave the site and enter the bio-retention basin. Post-project flows will be roughly double the existing overland flows from the same area. The bio-retention basin will adequately detain proposed peak flows with sufficient freeboard within the basin at 10- and 100-year peak flow events., However, the concentration of flow from the processing pad to the one outlet of the bio-retention basin is a potential single point source of erosion. Uncontrolled runoff at this point could cause hillside erosion and this is a ***potentially significant impact***.

In addition, the asphalt processing site proposes to drain the cut slopes east of the processing area to the existing Black Bart Drive storm drain system. It is important to consider the impacts of the proposed drainage on the existing culvert that conveys stormwater from the south to the north side of Black Bart Drive. This culvert is located on Black Bart Drive approximately 900 feet west of the intersection with Highway 101 and consists of an 18-inch corrugated metal pipe with a drop inlet on the south side. The proposed storm drain configuration for the haul road between quarry and asphalt processing sites proposes to divert much of the overland flow that used to be conveyed to this existing culvert to proposed quarry culverts and overland flow dispersal father down Black Bart Dive. The proposed contributing drainage area to this culvert will be 2.5 acres, less than half of the original 5.9 acre watershed, and 10- and 100-year flow rates

[79] Federal Emergency Management Agency. Flood Insurance Study for Mendocino County, California Unincorporated Areas, June 16, 1992, pg. 22.

are estimated to decrease by 30%. Therefore, impacts to the County culvert under Black Bart Drive due to increased runoff from the proposed asphalt processing site are ***less-than-significant.***

Mitigation Measures

The following mitigation measures are designed to ensure that the proposed processing area will adequately control runoff erosion from the site at the single point outlet of the bio-retention basin and not cause gullying of the hillside below the outlet.

4.2-B.1 The bio-retention basin will be designed to minimize erosion at the point of outlet. To meet this standard, the following actions will be taken:

1. The flow from the basin must be attenuated via an increase in basin size and/or decrease in pipe outlet sizing to match post-construction runoff volume to pre-construction runoff volume for the smallest storms up to the 85th percentile storm event (or the smallest storm event that generates runoff, whichever is larger).

2. A slotted pipe dissipater shall be designed to capture and disperse outflow from the basin to the hillslopes below. The design will be provided by the applicant engineer and is subject to review and approval by RWQCB per the NPDES discharge requirements.

3. Visual observations shall be made at the bio-retention basin outlet after each rain event. Photos from two photo points (one upslope and one downslope of the pipe outlet) shall be taken before (October-November) and after (March-April) the rainy season of each year of quarry operation. Photos shall be available for review by RWQCB and will be submitted with the Construction and Industrial General Permits' annual reporting.

Impact Significance After Mitigation

The mitigation measure provides appropriate methods for controlling point-source erosion and runoff from the asphalt processing site via the bio-retention basin to the downslope hillsides. The recommended measures would reduce the erosion and gullying impacts due to increased runoff from the asphalt processing site to a ***less-than-significant*** level.

Groundwater Depletion and Pollution

Impact 4.2-C The project could adversely affect groundwater resources.

The proposed project would result in increased use of water that would be pumped from project wells. As additional water resources are used for aggregate processing, local groundwater resources could be adversely affected. In addition, quarry activities could affect how water moves through rock fractures, potentially changing recharge patterns,

as well as flow rates in nearby wells and springs. Water from the on-site wells will be used for aggregate washing and for dust control. Harris Quarry plans to activate an existing, inactive aggregate wash water plant that uses a closed loop system that would recycle wash water. However, a certain amount needs to be added to the system to make up for water lost by evaporation, transport in washed materials, and other operational factors. As roads are paved, water required for dust control on roads will decrease. However, the proposed increase in production would require more water for materials processing and interim dust control of these processed materials. In addition to the project affecting the quantity of groundwater, groundwater quality could be impacted if water contaminated with fuel or other mobile pollutants is allowed to infiltrate at the site.

Water demand estimates for the existing quarry are summarized in Table 3-2 (in Section 3.2 earlier in this EIR). The processing rate is projected to increase to 400 tons/hour for base rock (two days a week) and 250 tons/hour for other products (four days a week). During the peak season, the water demand for processing would increase to about 10,000 gallons per day (gpd) for the higher rate and 6,250 gpd for the lower rate. During the off season, the water demand for processing would be about 6,400 gpd for the higher rate and 4,100 gpd for the lower rate. The total water demand for processing would increase to 1,103,800 gallons per year or 3.4 acre feet per year (afy), an annual increase of 510,300 gallons per year (1.6 afy).

Water used to wash aggregate for concrete and asphalt production is currently done at the applicant's wash plant in Willits, where it is discharged to settling ponds at the Willits facility and is recycled after the fines have settled out. A flocculent is added to the ponds to accelerate the settling process. The new wash plant to be installed at the quarry will use a 20,000-gallon tank instead of settling ponds, and a press will be used to remove water from the fines more quickly and completely. Washing would occur on about 65 days during the peak season and about 40 days during the off season. The make-up water requirements are estimated to be about 10,000 gpd. The total water demand for washing would be about 1,050,000 gallons per year (3.2 afy).

The daily water demand for dust suppression is expected to remain the same as current demand, ranging from a high of 7,200 gallons per day during the driest part of the peak season to 2,400 gallons per day during the off season. However, the total water demand for dust suppression is projected to increase in the off season because the number of days of application would increase from 30 to 65. The total water demand for dust suppression is projected to increase to about 804,000 gallons per year or 2.2 afy.

Under proposed future conditions, peak water demand, including water used by the relocated washing operations, would increase to about 19,200 gpd, or an average of 13.3 gpm on a peak day. The average pumping rate during all days of operation in the peak season would be 12.1 gpm. The total future water demand is estimated to be about 2,957,800 gallons per year (9.1 afy). This represents an increase of about 1,644,300 gallons per year (5.0 afy).

Groundwater Quality

Depending on the season, groundwater is at a depth of between about 25 to 50 feet below ground surface in nearby wells and springs (near the 2,020 foot elevation);

however, depth to groundwater beneath the quarry floor at the site is not known. A well drilled to 500 feet in the southeast corner of the quarry was found to be dry. This supports the hypothesis that groundwater is contained only locally (and at difficult to predict locations) within fractured and weathered zones in the underlying bedrock.

Groundwater quality at the site may be impacted by accidental spills or leaks if immediate action is not taken to remediate the spills; however the applicant has a spill prevention plan in place, and compliance with the NPDES Construction General Permit and SWPPP shall provide appropriate spill prevention and cleanup protocols.

Blasting

Typically, blasting effects on water quality and supply are not assessed in EIRs for aggregate mining operations. Most studies of blasting on water quality and supply are related to coal mining. Typically, the breaking or cracking of the rock is localized in the area around blast holes, and off-site rock structure, aquifers, or well installations are typically not affected. Studies where effects were observable were in layered sandstone, shale, and coal formations in coal mines[80], and in underground research facilities[81]. The primary factors in the effects of blasting on groundwater quality and supply for wells is (1) the proximity of groundwater-bearing rock fractures and blasting locations, (2) the direction of groundwater flow, and (3) the complexity of groundwater bearing units. Blasting effects on water quality are generally very localized and short lived.

Gascoyne and Thomas (1997) found short lived anomalies such as decreases in dissolved anion Cl, F, Br, SO4, and gas He, Rn and concurrent small increases in NO3 and O2 within 40 meters of blasting locations, and that observations of changes in groundwater are possible where groundwater pathways are known, and that response travel time is rapid. Distances to groundwater wells beyond Harris Quarry are well over 40 meters (130 feet). Hawkins[82] found that blasting caused no noticeable water table fluctuations and the hydraulic conductivity was unchanged.

In perhaps the most applicable of the studies,[83] which was performed in intensely folded and fractured bedrock geology similar to the study area, topographic and drainage modifications by a quarry resulted in lowering of the water table and a reduced groundwater recharge area. These changes proved critical for wells up-gradient from the blasting locations. Water quality was adversely affected in ungrouted wells that allow loose material along the well bore to travel down the outside of the well casing and enter the well hole after blasting or rainfall. In the case of Harris Quarry, drinking water supply wells are not located up-gradient from the quarry. The closest spring is located 6,000 feet to the west, and across the gradient from the quarrying area. The distances

[80] Philip R. Berger & Associates, Inc. “Survey of Blasting Effects on Ground Water Supplies in Appalachia.” November 1980.
[81] Gascoyne, M. and Thomas, D.A. “Impact of blasting on groundwater composition in a fracture in Canada’s Underground Research Laboratory.” Journal of Geophysical Research, Vol. 102, No. B1, Pages 573-584, January 10, 1997.
[82] Hawkins, J. Impacts of Blasting on Domestic Water Wells. Workshop on Mountaintop Mining Effects on Groundwater. May 9, 2000.
[83] Siskind, D.E. and Kopp, J.W. “Blasting effects on Appalachian water wells.” IC 9135 Surface Mine Blasting. Proceedings: Bureau of Mines Technology Transfer Seminar, Chicago, IL. April 15, 1987.

between the blasting locations and local groundwater resources are greater than the area of effects of blasting.

No other groundwater quality impacts are likely to occur as a result of the project. This represents a ***less-than-significant impact.***

Groundwater Quantity

Potential groundwater-related impacts associated with the project, including continued and expanded use of the quarry well, can be divided into three categories:

- Adverse well interference,
- Groundwater withdrawal in excess of recharge, and
- Local fracture flow disruption

Each of these issues are discussed below.

Quarrying Activities May Have Adverse Well Interference Effects

Well interference refers to the groundwater drawdown effects on neighboring wells from the pumping of a given well or group of wells. The extent of the effect, if any, depends on a number of factors, including the distance between the wells, pumping rates, and the general nature and hydraulic properties of the aquifer. Generally, the best way to determine potential well interference effects is through the completion of a pumping test (as was completed for the applicant by Rau, 2007 and Ludhorff & Scalmanini, 2010) in which water levels in the pumped well and an adjacent well or wells are monitored during the pumping period and a recovery period following completion of the pumping. Knowledge of well construction details for the wells being pumped and monitored and a general understanding of the area hydrogeology are necessary to properly interpret the test data.

Well interference effects can be both short term, via local pumping cone of depression effects, or long term, via groundwater withdrawn in excess of recharge rates that lowers local groundwater levels, sometimes below the depth of nearby existing wells.

Based on the applicant-furnished pump test results, the response of the monitoring wells to the pumping of Well #1 leads to the conclusion that there is not a good direct hydraulic connectivity among the groundwater bodies surrounding the quarry well and the two monitoring wells (see Figure 4.2-2 for the location of the wells). Connectivity in these aquifer materials relies on good connections among major, intersecting rock fracture zones.

Groundwater connectivity between project wells and more distant wells is expected to be very low, as described below:

- to the south, (because of the primarily non-water-bearing hard rocks of the quarry area),
- to the east, (because of blockage by the Maacama fault zone), and
- to the west (because of the occurrence of Forsythe Creek, and a ridgeline further southwest).

The hydrogeology of the quarry area is comprised of relatively very hard, slightly fractured greenstone rock (hence the quarry stone resource) that contains few if any continuous rock fractures that are capable of storing and transmitting groundwater through fracture flow to the north, south, or west.

Given these conditions, adverse well interference effects between the on-site quarry well (during extended and heavy use periods) and the more distant wells (such as some of the closer wells on the Ridgewood Subdivision) are remotely possible, but expected to be very minimal.

The Maacama Fault zone occurs to the east of the quarry, roughly paralleling Highway 101. The subdivided topography, diverse geologic units, and the presence of abundant landslides in this zone indicate that the rocks within it are highly sheared and shattered, while the occurrence of springs indicates that any east-west trending fracture zones in the underlying bedrock have been disrupted by fault movement and rock shearing, forcing local groundwater flow to the surface. Apparently there is little likelihood of groundwater in rock fracture zones to the east of Highway 101 moving west through the proposed quarrying area that would recharge groundwater further to the west of the quarry. Similarly the Maacama Fault would likely block and disrupt any groundwater that would otherwise (prior to quarrying) travel east through rock fractures to recharge areas east of Highway 101.

The pump tests can be interpreted as indicating no potentially significant effects on the near-by monitoring wells, and no significant impacts are expected to occur for any well farther to the north-west that are not included among the springs and wells on Figure 4.2-2. The presence of the band of highly weathered and fractured rock to the north that may trend transversely (northwest-southeast) through the quarry would likely preclude any adverse well interference effects from extending beyond the band further to the north, since the fractures would intercept and divert flow to the west.

In addition, in order to predict future pumping impacts, groundwater flow model simulations were used to estimate the drawdown that would result from planned pumping to meet future water demands (Ludhorff & Scalmanini, 2010). Well 1 was modeled as pumping at a rate of 12.1 gpm for a 120-day period, simulating proposed peak-season project water demand over an extended period of time. For this simulation, the maximum simulated drawdown at Well 1 was about 49 feet (drawdown is the decrease in water depth in a well measured from the top of the well down). Based on the model results, the five-foot drawdown contour is predicted to extend about ½ mile from Well 1 at the end of the peak operating season. Drawdowns outside this ½-mile radius are predicted to be less than five feet. There are no active domestic wells or mapped springs within the predicted five-foot drawdown contour.

A more detailed simulation modeled Well 1 for a 20-week period for projected weekly pumping cycles (6 days of continuous pumping and one day of recovery). The simulated pumping rate during the majority of the season was 11.7 gpm. During the driest five weeks of the season (assumed to be early August through mid-September), a higher pumping rate of 13.3 gpm was used. At Well 1, this simulation predicted maximum drawdowns of about 50 feet at the end of the driest period and about 46 feet at the end of the simulation. However, the recovery day at the end of each week allowed recovery of most of the water levels in the well. The model results indicate that water levels would

decline slightly from week to week due to small residual drawdown at the end of each one-day recovery period. The simulated residual drawdown was about five feet at the end of the first week but decreased each week. By the fourth week, the incremental residual drawdown had decreased to less than one foot per week. The total predicted water level decline in Well 1 was about 16 feet at the end of the 20-week simulation. While this simulation did not model predicted drawdown outside Well 1, it can be assumed that since the maximum drawdown for this second simulation was 46 feet by the end of the simulation, and the maximum simulated drawdown at Well 1 was 49 feet for the first simulation, a hypothetical five-foot drawdown contour for the second simulation would also extend about ½ mile from Well 1. The findings for this simulation are consistent with the first simulation described in the previous paragraph. Full water level recovery would be expected during the off season.

Based on the above analyses, it is concluded that increased project use of groundwater would not adversely affect groundwater resources tapped by neighboring wells and springs. The potential well interference effects would be a ***less-than-significant impact***.

Quarrying Activity May Cause Groundwater Withdrawal in Excess of Recharge.

Groundwater withdrawal (by heavy pumping) that exceeds the storage and recovery or recharge capabilities of an aquifer is sometimes termed "groundwater mining". The "fair-share" principle has been used to evaluate this issue in other areas of northern California. Under a fair share use analysis for CEQA purposes, allowable groundwater use is considered to be equal to the long-term average natural rainfall recharge to the groundwater body that occurs within the parcel in question. CEQA analysis is different than California Water Law, as it is generally recognized that the owner of a well (in a non-groundwater adjudicated basin) has the right to underlying groundwater, as long as it is beneficially used and not transported outside of the basin of origin.

Groundwater recharge for the Harris Quarry area was estimated by the annual water budget method. In this method, Mean Annual Runoff (Roff) and Mean Annual Evapotranspiration (ET) are subtracted from Mean Annual Precipitation (Ppt) to estimate the total amount of incident annual precipitation that is available for Annual Recharge (Rchg.)

(Rchg = Ppt - Roff - ET).

For the Harris Quarry Area; Mean Annual Rainfall (Ppt) is estimated to be 51.3 inches per year; Evapotranspiration (ET) is estimated to be 16.2 inches for November through June, the time when water can percolate into the bedrock aquifer.[84] Mean Annual Runoff is estimated to be about 31.5 inches.[85]

51.3" Ppt – 31.4" Roff – 16.1" ET = 3.8" Annual Recharge;

[84] Evapotranspiration estimated from rates for the Ukiah area published by UC Cooperative Extension, updated 2000.

[85] McKee et al., 2003. A Review of Urban Runoff Processes in the Bay Area. San Francisco Estuary Institute.

This represents runoff of about 7% of the annual rainfall, a credible estimate given the average slope, soils and underlying geologic materials of the project area.

It is estimated that there is currently approximately 3.8 inches of recharge available per year (0.30 acre-feet per acre per year) for aquifer recharge, or 107.3 acre-feet from rainfall on the project area lands owned by the quarry operator (~335.3 acres of the applicant's parcels on which the project is located). If only the lands immediately involved in the quarrying and processing are considered (about 78.2 acres), the estimated average annual recharge for this area is estimated to be 25 acre-feet per year. The well is predicted to produce 24.2 acre feet/year and future water demand is predicted to be about 9.1 acre feet per year. The amount of well water expected to be used (9.1 acre feet/year) is within the 'fair share' concept of annual groundwater recharge on lands controlled by the applicant proposed to be used for quarry and processing activities (25 acre-feet/year). Thus, impacts from groundwater recharge losses due to quarry withdrawals are ***less-than-significant***.

Quarrying Activities May Cause Local Fracture Flow Disruption and Spring Flow Interception

If a band of fractured and highly weathered bedrock that transmits groundwater over some distance does occur as inferred from the geologic data, then there would be a concern that rock quarrying activities could somehow disrupt or intercept groundwater flow moving within this zone. This could potentially impact spring flow for the springs located in this band. This is not likely to occur as rock quarrying is not proposed within what Questa Engineering Corporation has identified as a possible band of highly weathered and fractured, or sheared rock that contains most of the wells and springs. As previously indicated, local groundwater is inferred to be present within this band, but not likely present in appreciable quantities to the south of the band in the proposed quarrying area. The proposed quarry expansion stops short of this band. In addition it appears that the spring on Black Bart Drive used by some of the neighbors, and located to the west and north of the quarry, is topographically at an elevation above the quarry by about 80 feet. Therefore, physical disruption of any such weathered rock or shear and fracture zones that serve to transmit flow laterally (and hydraulically upgradient) is not likely. Thus, impacts from quarrying activities that may cause local fracture flow disruption and spring flow interception are ***less-than-significant***.

Summary and Conclusions

Based on an examination of the hydrogeology of the site and the surrounding area, the results of pump tests done on the project well, and computer modeling of the effects of long-term future project pumping, there is no evidence that project water use would adversely affect wells and springs owned or used by other property owners. The project would have a ***less-than-significant impact*** on groundwater quantity and quality.

3. Cumulative Impacts

Cumulative Water Quality Impacts

Impact 4.2-D The project in combination with other projects would generate sediments and other pollutants that could potentially violate water quality standards and/or impact habitat.

There are no other proposed projects in the immediate project area or the watershed of Forsythe Creek. The only cumulative biological impacts that the project might contribute to would be water quality impacts on Forsythe Creek from the proposed project, any future incidental residential development in that watershed, and timber harvesting in that watershed. The Church of the Golden Rule has an approved Non-industrial Timber Management Plan (NTMP) for their property which allows the Church to cut a sustained harvest of timber off their property, which contains lands within the Forsythe Creek watershed. A review of the NTMP shows that this harvesting is not expected to have an adverse impact on water quality resources. The timber harvest on the property that includes the project site has been completed.

The project combined with adjacent timber harvesting and possible future development in the Forsythe Creek watershed could adversely affect water quality of the stream, which would be a ***potentially significant cumulative impact***.

Mitigation Measures

The mitigation measures recommended for Impact 4.2-A apply to this impact.

Impact Significance After Mitigation

Project compliance with required mitigations will ensure that the project does not adversely affect water quality in Forsythe Creek or the Russian River. It is assumed that future timber harvests on Ridgewood Ranch would comply with all water quality protections included in the adopted NTMP. The cumulative impact would therefore be reduced to a ***less-than-significant*** level.

Impact 4.2-E Future mining of the quarry could generate sediments and other pollutants that could potentially violate water quality standards and/or impact habitat.

Future expansion of the quarry (after the 30-year extension sought in this Use Permit) could generate sediments and other pollutants that could significantly affect water quality in Forsythe Creek. The pollution potentially generated by the project could combine with this additional future pollution to have significant long-term impacts on water quality and habitat in and along Forsythe Creek. This would be a ***potentially significant cumulative impact.***

Mitigation Measures

The mitigation measures recommended for Impact 4.2-A apply to this impact.

Impact Significance After Mitigation

Project compliance with required mitigations will ensure that the project does not adversely affect water quality in Forsythe Creek or the Russian River. With recommended mitigations, the project would make a ***less-than-cumulatively considerable*** contribution to any cumulative impact on water quality. In addition, it is expected that like this project any future mining will be required to control sedimentation and pollution, so it is expected that there would not be a significant cumulative impact given continuation and possible expansion of water quality mitigation measures.

Cumulative Impact on Runoff Regime

Impact 4.2-F Future expansion of the quarry will alter the runoff regime to Forsythe Creek.

Future expansion of the quarry beyond the proposed 30 years would further reduce the runoff to the tributary of Forsythe Creek. A review of the quarry footprint for the original project assessed in the original Draft EIR shows that this footprint was 42% larger than the current proposal. This would result in approximately an additional 14% reduction in 100-year peak flows in the Forsythe Creek tributary. This in turn represents an approximate total of a 5% decrease in flows in the Upper Forsythe Creek watershed below the stream segments affected by the project. This is not expected to be a significant reduction. In any case, the project's contribution (a 2.2% reduction during the 100-year event) would be a ***less-than-considerable*** contribution to any cumulative impact on streamflows***.*** It is expected that this potential long-term impact to runoff would be assessed at the time a future application is made. Existing conditions may have changed at the time, given projected climate change as well as other factors.

The original project proposal assessed in the original EIR included mining to an elevation of 1,650 feet, which would have brought the quarry floor to the same channel bed (or thalweg) as the ephemeral tributary of Forsythe Creek, located 1,000 feet to the south. That EIR concluded that mining to this depth would have a potentially significant impact on streamflows and possibly on springs in the area. This is a potentially significant impact. However, the current project does not include deepening the quarry floor. As such, it makes a ***less-than-considerable*** contribution to this possible future impact. In addition, it is expected that the County would require the future CEQA analysis of a deeper quarry to include assessment of streamflows and area springs as was recommended in Mitigation Measures 4.2-C.1 and 4.2-C.2 of the original Draft EIR.

Cumulative Impact on Groundwater

Impact 4.2-G Future expansion of the quarry could adversely affect groundwater resources.

Future mining would be expected to have similar water demands as the proposed project. Based on the data described previously in this section of the EIR, the future use would not have a significant impact on other wells or springs. In any case, the project's water use would be terminated by the time any future mining occurred, so it would not contribute to any future impact to groundwater resources. The project makes a ***less-than-considerable*** contribution to this possible future impact. In addition, it is expected that the CEQA analysis of any future mining will require a full assessment of impacts to neighboring wells and springs.

4.3 BIOLOGICAL RESOURCES

The following analysis of biological impacts was prepared with the technical input of North Coast Resource Management (NCRM). To assess the potential impacts to Biological Resources, including special status plant and wildlife species and sensitive habitats, NCRM reviewed sensitive species database reports and biological reports prepared for and submitted by the applicant, and conducted additional botanical and wildlife surveys of the proposed project. For this report, the "Project Area" is defined as the area including the quarry expansion site and the site of the proposed asphalt processing facility.

A. Setting

The general area ranges in topographic diversity from ridgetops and steep canyons to small valleys and swales. The project site is characterized by its headwaters position for tributaries of Forsythe Creek. Forsythe Creek lies south of the project site and traverses the area from northwest to southeast. Further south, Walker Creek enters Forsythe Creek, while to the east, Davis Creek traverses the general area from southeast to northeast. The current quarry lies approximately 500 feet north of an unnamed tributary to Forsythe Creek; and the proposed asphalt processing facility is approximately 800 feet north of the nearest Forsythe Creek tributary. The overall project area ranges in elevation from approximately 1,700 feet to 2,320 feet above sea level. In addition to these topographic features, the general area contains a variety of habitat types, including montane hardwood-conifer, oak woodland, grassland, chaparral, riparian, riverine, and lacustrine.

1. Vegetation

The existing quarry area is composed of the active quarry site, access roads, and other improvements. The current quarry activity is located on the south side of a ridge, and does not contain any natural habitat areas that would support special status species.

a. Proposed Quarry Expansion Area

The proposed quarry expansion area is composed of a ridge with 30-80% slopes; the south side of the ridge is steep. Based on the dominant vegetation, the two plant communities on this site correlate with the *Adenostoma fasciculatum* Shrubland Alliance and the *Umbellularia californica* Forest Alliance.[86] The Shrubland Alliance is densely vegetated with chamise (*Adenostoma fasciculatum*), mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), manzanita (*Arctostaphylos manzanita* ssp. *glaucescens*), buckbrush (*Ceanothus cuneatus*), silktassel (*Garrya fremontii*), and scrub oak (*Quercus* sp.). The Forest Alliance is composed primarily of bay (*Umbellularia californica*) and buckeye (*Aesculus californica*) trees with scattered chaparral shrubs.

The north side of the ridge has a history of logging and is currently composed of an uneven-aged stand of tan-oak *(Lithocarpus densiflora*), with scattered Douglas-fir (*Pseudotsuga* menziesii) and madrone (*Arbutus menziesii*), trees. The over-story

[86] Sawyer & Keeler-Wolf (2009)

canopy is 60-70% closed, and supports minimal understory plant species, including poison oak (*Toxicodendron diversilobum)*, coyote brush (*Baccharis* pilularis), and gooseberry (*Ribes* sp.). This habitat corresponds to the *Pseudotsuga menziesii-Lithocarpus densiflorus* Forest.[87]

b. Proposed Asphalt Processing Facility Site

The proposed asphalt facility area is undeveloped except for an old log landing, a dirt road which heads up the ridge to the existing water tank, and a road around the north base of the hill that connects to the road to the well. The proposed site is situated on a 5-20% west-facing slope. It is vegetated with open grassland and two oak woodland communities, which transition to the Douglas-fir tan-oak forest present on the north facing ridge. The slope then gets steeper towards the south where several tributaries of Forsythe Creek are located. There are two seasonal swales or shallow drainages along the southeastern and southwestern edge of the processing area, which appear to channel seasonal runoff from the upper slopes on the project site to the Forsythe Creek tributary. During on-site visits, water was observed flowing but, no riparian or hydrophytic vegetation was observed in these swales. There are no mesic or riparian habitats within this area.

The grassland is primarily vegetated with non-native grass species, including: hedgehog grass (*Cynosurus echinatus)*, Medusahead (*Taeniatherum caput-medusae*), and wild oats (*Avena* sp.). Native grasses were present as well, including blue wildrye (*Elymus glaucus*) and California oat grass (*Danthonia californica*). The grassland includes annual wildflowers and herbs such as slender tarweed (*Madia gracilis*), Ithuriel's spear (*Triteleia laxa*), clarkia (*Clarkia purpurea ssp. quadrivulnera*), fringed sidalcea (*Sidalcea diploscypha*), and Queen's Anne's lace (*Daucus carota*). Within the grassland area are scattered oaks including Valley oak (*Quercus* lobata), Oregon white oak (*Quercus garryana*), and black oak (*Quercus kelloggii*).[88] Along the northern edge of the asphalt processing facility site is a dense stand of oaks that correlate to the *Quercus garryana* Woodland Alliance - Oregon white oak woodland plant community.

c. Quarry Access Road Drainage

There is an existing northwest-southeast drainage on the east side of the quarry site. This drainage lies immediately southwest of the driveway from Highway 101 to the quarry. This drainage was developed to drain runoff from the east side of the highway and the highway itself; it also captures runoff from the slope to the west that is on the project site. This drainage, from above the existing culvert under Highway 101, is mostly undefined and slightly 'U' shaped, ranging from 2-feet to 4-feet wide and 1-foot to 2-feet deep at the base. The driveway bank on the northeast side of the drainage is a moderate to steep slope, and ranges from approximately 4-feet to 8-feet deep; whereas, the hillside bank is a gentle slope, and ranges from approximately 1-foot to 3-feet deep.

Beyond this gentle, undefined area, is a rock/boulder fall with a 10-foot to 12-foot gradual fall. The rock fall and the area above was dry in July, however, some water

[87] Ibid.
[88] This correlates to the *Quercus lobata* Woodland Alliance-Valley Oak Woodland plant community; Sawyer and Keeler-Wolf (2009)

resurfaces below the fall. This area of the drainage is approximately 5-feet wide and is approximately 10-feet to 15-feet deep. Eventually, the drainage opens up, and the actual drainage area is confined to 3-feet deep and 4-feet wide before it enters the existing culvert that carries runoff beneath the quarry. The extent of channel habitat in the area that is under the jurisdiction of the Army Corps of Engineers is approximately 1,400 square feet or 0.03 acre (based on a total of 410 lineal feet of channel averaging between 2 to 5 feet in width).

The drainage provides seasonal runoff drainage from the hillside. No significant riparian vegetation was observed along the drainage. The drainage has a sparse herbaceous layer; the mid-layer and dense over-story canopy consisted of big-leaf maple, Douglas-fir, tanoak, madrone, Himalayan blackberry, poison-oak, dog wood, hazel nut, wild rose and some ferns. This drainage does not support significant riparian vegetation. However, it would be considered "waters of the U.S."

Between the proposed on-site haul road and Black Bart Drive, there is a small wetland that is about 0.04 acres in size. This wetland is shown on Figure 3-4 (it is the shaded area immediately west of the proposed leachfield site). The vegetation in this wetland correlates to the *Rubus* Shrubland Alliance. It is primarily vegetated with California blackberry (*Rubus ursinus*), panicled bulrush (*Scirpus microcarpus*) and coast tarweed (*Madia sativa*). This plant community alliance is an isolated inland occurrence.

2. Special Status Species

NCRM surveyed the Project Area for special status species in 2006 and for special status plant communities in 2008 and 2010. No sensitive species have been identified on the project site. Earlier reports prepared for the project, including, the *Harris Quarry Biological Study* (October 2004) and *Botanical Survey Results for the Harris Quarry Expansion and Production Plant Project* (September 2005) prepared by Mad River Biologists also found no special status species on the site.[89]

a. Plants

A special status plant species scoping list was constructed based on the California Native Plant Society (CNPS) electric inventory (November 2010) and the California Natural Diversity Database (CNDDB) version 3 (November 2010), nine 7.5' USGS Quadrangle search parameter. This was based off of the Laughlin Range Quadrangle and the eight adjacent quadrangles, including Burbeck, Willits, Foster Mountain, Redwood Valley, Ukiah, Orrs Springs, Bailey Ridge and Greenough Ridge. The data bases were further consulted prior to the completion of this report to ensure that any changes on these data bases were included in the scoping list. CNPS watch list or list 3 and 4 plant species were not included in the scoping list but were considered and surveyed for. Plants not on these data bases but known to occur in the region based on further study or other references were also included in the scoping

California Natural Diversity Database (CNDDB) Rare Find version 3 (November 2010) was consulted to identify past-reported rare or endangered plant populations on or near

[89] All these reports are on file and available for review at the Mendocino County Department of Planning and Building Services.

the project site. Any relevant and accessible special status plant populations were visited for reference. At the time of the surveys conducted, all of the special status plant species considered in this study, were known to be within their blooming window and identifiable.

Site surveys for special status plants were conducted on May 17, June 28, and August 28, 2006; additional botanical assessments were conducted in 2008 and 2010. Surveying methods were based on the *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Plant Communities* developed by James Nelson (CDFG 2000). Survey efforts focused on identifying special status plant species and plant communities within the project area. A floristic and seasonally appropriate survey was conducted by systematically walking the project area, targeting areas with potential suitable habitat for special status plant species.

All plant species located during the floristic surveys were identified to the lowest taxonomic level necessary to determine the presence of special status plant species. The *Jepson Manual: Higher Plants of California* (Hickman 1996) was used to determine the taxonomic nomenclature. *A Manual of California Vegetation* (Sawyer & Keeler-Wolf 1995 and 2009) was used to classify and describe representative plant communities present. For additional description of the plant communities present the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) was also used. A complete vegetation list of the plant species observed during the 2006, 2008, and 2010 site visits is included in Appendix B.

Based on the conducted site visits, no special status plant species were found. This confirms the findings of the previous studies that have been conducted within the proposed development areas. No watercourses that support riparian vegetation were found. As described previously, there is one small wetland located near Black Bart Drive that supports hydrophytic plants.

A special status plant species list was developed, and includes 38 plant species. For a full description of the habitat requirements, blooming period and listing status, refer to the Special Status Plant Species Scoping List in Appendix B. Although all the plant species within the scoping list were surveyed for, the majority of plant species do not have suitable habitat within the project areas.

Within the proposed processing area the following plant species may have potential habitat: *Cryptantha excavata (*deep-scarred cryptantha), *Gilia capitata* ssp. *pacifica* (Pacific gilia), *Viburnum ellipticum* (oval-leaved viburnum), *Tracyina rostrata* (beaked tracyina), *Hemizonia congesta ssp. leucocephala* (hayfield tarplant) and *Fritillaria roderickii* (Roderick's fritillary). Generally these listed plant species are associated with valley and foothill grasslands, cismontane woodlands, and chaparral habitats, within Mendocino County and the surrounding areas. None of these plant species were observed during the conducted site visits.

*Hesperolinon adenophyllum (*glandular western flax), *Arctostaphylos canescens ssp. sonomensis* (Sonoma manzanita), and *Arctostaphylos stanfordiana ssp. raichei* (Raiche's manzanita) have very marginal and very low potential habitat on the project site. These species are associated with similar habitats as the above-listed plants, but are generally found where there are soils derived from serpentine. Serpentine soils or

other specific preferred habitat conditions are not present on the project site; there is a low possibility that these species could exist within the areas surveyed.

Within the quarry expansion area, Humboldt milk-vetch (*Astragalus agnicidus)* small groundcone (*Boschniakia hookeri*), Minute pocket-moss (*Fissidens pauperculus*), Seaside Lotus (*Lotus formosissimus*), White-flowered Rein Orchid, (*Piperia candida*), North Coast semaphore grass *(Pleuropogon hooverianus*), Robust false lupine (*Thermopsis robusta*), and Long-beard lichen (*Usnea longissima*) have potential habitat within the forested area along the northeast side of the ridge and potentially along the margins of the processing area were the forested area integrates with the oak woodland and Robust monardella (*Monardella villosa* ssp. *globosa*), Mayacama popcorn-flower (*Plagiobothrys lithocaryus*), and Oval-leaved viburnum (*Viburnum ellipticum*) have potential habitat within the chaparral area along the south side of the ridge These plant species were not found.

Within the mesic habitats along the access road, the highway expansion area, and the wetland and stream mitigation areas suitable habitat for Narrow-leaved water-plantain (*Alisma gramineum*), Coast fawn lily (*Erythronium revolutum*), Burke's goldfields (*Lasthenia burkei*), Baker's meadowfoam (*Limnanthes bakeri*), and Few-flowered Navarretia (*Navarretia leucocephala ssp. bakeri*) may be present.

b. Wildlife

Special status wildlife species are those listed as Rare, Threatened, Endangered, Sensitive, or Species of Special Concern, by the U.S. Fish and Wildlife Service, California Department of Fish and Game, California Department of Forestry, Bureau of Land Management, or the U.S. Forest Service. To determine the potential for special status wildlife species to occur within or near the project area, the Biological Assessment Area (BAA) was evaluated as well.[90] The BAA contains a variety of habitat types, including montane hardwood-conifer, oak woodland, grassland, chaparral, riparian, riverine, and lacustrine. Forsythe Creek traverses the BAA from northwest to southeast; and in some areas is approximately 500 feet south of the project area. To the south, Walker Creek traverses the BAA and finally drains into Forsythe Creek. Additionally, Davis Creek, to the east of the project area, traverses the BAA from southeast to northeast.

To determine the potential for special status wildlife species to occur within the project area or BAA, topographical maps, aerial photographs, and queries of the following database programs were reviewed in October 2010. The Biogeographic Information and Observation System / Northern Spotted Owl Database (BIOS/NSO) was queried for known Northern Spotted Owl Territories located within the BAA. The California Natural Diversity Database (CNDDB) was queried for known occurrences of special status wildlife species within the Bailey Ridge, Burbeck, Foster Mountain, Greenough Ridge, Laughlin Range, Orr Springs, Redwood Valley, Ukiah, and Willits 7.5' U.S.G.S. Quadrangles. The California Wildlife Habitat Relationships (CWHR) program was queried for potential special status wildlife species occurring in Montane Hardwood habitat within Mendocino County.

[90] The Biological Assessment Area (BAA) is defined as the area within 1.5 miles of the project site.

Some species reported in the CWHR are not germane to this project; as suitable habitat or the species known range is not within the project vicinity; or the status pertains to a distinct subspecies located well outside the BAA, typically another County. Additionally, some species reported in the CNDDB are not likely to occur within the property, but there are known occurrences within a queried quadrangle. The potentially occurring sensitive wildlife species are reviewed in the Special Status Wildlife Species list located in Appendix B.

Wildlife surveys of the project area were conducted on June, July, and August, 2006 by Jennifer Bartolomei, Consulting Biologist. Additional general wildlife surveys were conducted on September 22 and 23, 2010; again, no special status wildlife species were detected. The surveys primarily consisted of general raptor/wildlife survey stations and random walking transects. Survey coverage was complete, however, survey effort, varied proportionately with special habitat elements. Species were detected by observation, vocalization, or sign.

Raptor/wildlife survey stations (±20min. each) were located in areas with high visibility, and consisted of observing the surrounding area and vegetation with and without binoculars. Walking transects were conducted around and through the montane hardwood forest and oak woodland, searching for wildlife species, nest or roost trees, cavities, plucking posts, white wash, pellets, scat, tracks, trails and burrows. Special habitat elements examined include habitat edges, large conifer and hardwood trees, downed woody debris, rock outcrops, a small roadside drainage, and stick nests (gray squirrel) within the project area. In addition, brief driving transects, on roads within the BAA, were driven slowly (as possible) to search for raptors or other wildlife, with periodic stops to listen and scan the area with binoculars.

The database queries reported 27 sensitive wildlife species that have the potential to occur within the BAA; of those listed, the golden eagle (*Aquila chrysaeto*s), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), and pallid bat (*Antrozous pallidus*) may have some potential to occur within the project area. However, no special status species were detected during the 2006 surveys. Additional general wildlife surveys were conducted in September 2010, and no special status species were detected during those surveys.

Overall, the project site, was found to have high noise levels; primarily due to the existing quarry operations and traffic on Highway 101 and Black Bart Drive. There are few to no special habitat elements (i.e., water sources, remote snags, large woody debris, etc.) or areas of significant biological diversity within the project area. In addition, there appeared to be a general lack of even common wildlife species. Besides the gray squirrel nests, there were no other nests or sensitive status species detected within the project area. A list of wildlife species detected, within the site or BAA, is included in Appendix B.

3. Regulatory Framework

a. Federal

Federal Endangered Species Act (FESA)

The FESA of 1973, as amended, provides the regulatory framework for the protection of plant and animal species (and their associated critical habitats), which are formally listed, proposed for listing, or candidates for listing as endangered or threatened under the FESA. The FESA has four major components: provisions for listing species, requirements for consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries), prohibitions against "taking" of listed species, and provisions for permits that allow incidental "take." The FESA also discusses recovery plans and the designation of critical habitat for listed species. Both the USFWS and the NOAA Fisheries share the responsibility for administration of the FESA. During the CEQA review process, each agency is given the opportunity to comment on the potential of the proposed project to affect listed plants and animals.

Sensitive Species

The United States Forest Service designates plant and animal species identified by a regional forester that are not listed or proposed for listing under FESA for which population viability is a concern, as evidenced by significant current or predicted downward trend in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution, as "sensitive." Although these species generally have no special legal status, they are given special consideration under CEQA during project review.

Clean Water Act Section 404 & 401

The Army Corps of Engineers (ACE) and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344). Waters of the United States are defined in Title 33 CFR Part 328. 3(a) and include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. The lateral limits of jurisdiction in those waters may be divided into three categories – territorial seas, tidal waters, and non-tidal waters – and are determined depending on which type of waters is present (Title 33 CFR Part 328.4(a), (b), (c)). Activities in waters of the United States regulated under Section 404 include fill for development, water resource projects (such as dams and levees), infrastructure developments (such as highways and airports) and mining projects. Section 404 of the CWA requires a Federal license or permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g., certain farming and forestry activities).

Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a Federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification from the State in which the discharge

originates or would originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the affected waters at the point where the discharge originates or would originate, that the discharge will comply with the applicable effluent limitations and water quality standards. A certification obtained for the construction of any facility must also pertain to the subsequent operation of the facility. The responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs).

U.S. Army Corps of Engineers

The USACE has direct jurisdiction over activities which will alter fresh water wetlands pursuant to Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by "ordinary high water marks" on opposing channel banks. Wetlands are habitats with soils which are intermittently or permanently saturated or inundated. The resulting anaerobic conditions support plant species known as hydrophytes which show a high degree of fidelity to such soils. Wetlands are identified by the presence of hydrophilic vegetation, hydric soils (soils intermittently or permanently saturated by water), and wetland hydrology according to methodologies outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region*. In locations where wetlands are present, a jurisdictional study is required. In cases where the wetland acreage to be filled is small and no sensitive rare or endangered species occur in the area, it is possible that filling will be authorized under certain Nationwide Permits. These Nationwide Permits apply in limited circumstances where the Corps has determined that the fill will not constitute a significant impact on the environment if carried out according to the limitations and conditions of the pertinent Nationwide Permit.

If the proposed fill is not authorized under a Nationwide Permit, the applicant would be required to obtain approval under the individual permit program administered by the Corps under Section 404. When an individual permit is required, the Corps analysis will include a determination of whether the project is "water dependent." The analysis per Section 404(b)(1) must include an analysis of practical alternatives to filling of wetlands. If the Corps authorizes a permit, it can require mitigations for the loss of jurisdictional wetlands. The Corps is required to consult with the U.S. Fish and Wildlife Service, NMFS, the EPA, and California Department of Fish and Game in carrying out its discretionary authority under Section 404. No permit can be issued until the RWQCB issues a certification (or waiver of such certification) that the proposed activity will meet State water quality standards. If an applicant is able to demonstrate that proposed filling of wetlands is necessary and that there is no practicable alternative to this filling, then the project mitigation plan would be reviewed by the U.S. Fish and Wildlife Service in relation to their mitigation policies.

U.S. Fish and Wildlife Service (USFWS).

The USFWS administers the Federal Endangered Species Act (ESA) and the Marine Mammal Protection Act. The USFWS operates under a number of statutory and administrative authorities. Its basic responsibilities concern migratory birds, anadromous fish, and endangered species. If a project involves a "take" of a Federally listed species,

then the USFWS must approve the permit for this "taking." "Take" is defined by the ESA as harassing, harming, pursuing, shooting, wounding, trapping, capturing, or collecting any listed wildlife species. Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter.

Take incidental to an otherwise lawful activity may be authorized by one of two procedures. If a Federal agency is involved with the permitting, funding or implementing of the project, then initiation of formal consultation between that agency and USFWS, pursuant to Section 7 of the ESA, is required if it is determined that the proposed project may affect a Federally listed species. Such consultation would result in a biological opinion that addresses anticipated effects of the project on listed and proposed species and may authorize a limited level of incidental take. If a Federal agency is not involved with the project, then an "incidental take" permit pursuant to Section 10(a) of the ESA should be obtained.

The USFWS is an advisory agency to the Army Corps on Section 404 and Section 10 projects. The USFWS will review mitigation plans for these projects. The USFWS identifies four different resource categories with criteria and mitigation goals for each. The Fish and Wildlife Service will review the resources on a site and assign a category to each. Each category has a specific set of mitigation requirements.

National Oceanic and Atmospheric Administration–Fisheries (NOAA– Fisheries)

NOAA - Fisheries administers the Federal Endangered Species Act and the Marine Mammal Protection Act as they pertain to marine and anadromous species. NOAA - Fisheries also advises the Army Corps of Engineers on Section 7 and Section 404 permits for projects that could affect fish habitat.

The Migratory Bird Treaty Act & Bald and Golden Eagle Protection Act

The Federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.), Title 50 Code of Federal Regulations (CFR) Part 10, prohibits taking, killing, possessing, transporting, and importing of migratory birds, parts of migratory birds, and their eggs and nests, except when specifically authorized by the Department of the Interior. As used in the act, the term “take” is defined as meaning, “to pursue, hunt, capture, collect, kill or attempt to pursue, hunt, shoot, capture, collect or kill, unless the context otherwise requires.” With a few exceptions, most birds are considered migratory under the MBTA. Disturbance that causes nest abandonment and/or loss of reproductive effort or loss of habitat upon which these birds depend would be in violation of the MBTA.

The Bald Eagle Protection Act (16 U.S.C. 668) was passed in 1940 to protect bald eagles and was later amended to include golden eagles. Under the act it is unlawful to import, export, take, sell, purchase, or barter any bald eagle or golden eagle, their parts, products, nests, or eggs. Take includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing eagles.

b. State of California

California Endangered Species Act

The State of California enacted similar laws to the FESA -- the California Native Plant Protection Act (NPPA) in 1977 and the California Endangered Species Act (CESA) in 1984. The CESA expanded upon the original NPPA and enhanced legal protection for plants, but the NPPA remains part of the California Fish and Game Code. To align with the FESA, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the CESA as threatened species, but did not do so for rare plants. Thus, these laws provide the legal framework for protection of California-listed rare, threatened, and endangered plant and animal species. The California Department of Fish and Game (CDFG) implements NPPA and CESA, and its Wildlife and Habitat Data Analysis Branch maintains the CNDDB, a computerized inventory of information on the general location and status of California's rarest plants, animals, and natural communities. During the CEQA review process, the CDFG is given the opportunity to comment on the potential of the proposed project to affect listed plants and animals.

Fully Protected Species and Species of Special Concern

The classification of "fully protected" was the CDFG's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibians and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under CESA and/or FESA. The Fish and Game Code sections (fish at §5515, amphibians and reptiles at §5050, birds at §3511, and mammals at §4700) dealing with "fully protected" species state that these species "…may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species, " although take may be authorized for necessary scientific research. This language makes the "fully protected" designation the strongest and most restrictive regarding the "take" of these species. In 2003, the code sections dealing with fully protected species were amended to allow the CDFG to authorize take resulting from recovery activities for State-listed species.

Species of special concern are broadly defined as animals not listed under the FESA or CESA, but which are nonetheless of concern to the CDFG because they are declining at a rate that could result in listing or because they historically occurred in low numbers and known threats to their persistence currently exist. This designation is intended to result in special consideration for these animals by the CDFG, land managers, consulting biologist, and others, and is intended to focus attention on the species to help avert the need for costly listing under FESA and CESA and cumbersome recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them. Although these species generally have no special legal status, they are given special consideration under CEQA during project review.

Porter-Cologne Water Quality Control Act

Waters of the State are defined by the Porter-Cologne Act as “any surface water or groundwater, including saline waters, within the boundaries of the state.” The RWQCB protects all waters in its regulatory scope, but has special responsibility for isolated wetlands and headwaters. These waterbodies have high resource value, are vulnerable to filling, and may not be regulated by other programs, such as Section 404 of the CWA. Waters of the State are regulated by the RWQCB under the State Water Quality Certification Program, which regulates discharges of dredged and fill material under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. Projects that require an ACE permit, or fall under other Federal jurisdiction, and have the potential to impact Waters of the State are required to comply with the terms of the Water Quality Certification Program. If a proposed project does not require a Federal license or permit, but does involve activities that may result in a discharge of harmful substances to waters of the State, the RWQCB has the option to regulate such activities under its State authority in the form of Waste Discharge Requirements or Certification of Waste Discharge Requirements.

California Fish and Game Code Sections 3503 & 3513

According to Section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except English sparrows (*Passer domesticus*) and European starlings (*Sturnus vulgaris*). Section 3503.5 specifically protects birds in the orders Falconiformes and Strigiformes (birds-of-prey). Section 3513 essentially overlaps with the MTBA, prohibiting the take or possession of any migratory non- game bird. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “take” by the CDFG.

California Fish and Game Code Sections 1600-1616

Streams, lakes, and riparian vegetation as habitat for fish and other wildlife species, are subject to jurisdiction by the CDFG under Sections 1600-1616 of the California Fish and Game Code. A 1602 Lake and Streambed Alteration Agreement is generally required for any activity that will substantially divert the natural flow of a stream, substantially alter its bed or bank, use any material from the streambed, or deposit material into a stream or lake. Such an agreement would usually include a requirement that there be no net loss of wildlife habitat values or that lost acreage would be replaced. Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFG.

Sensitive Vegetation Communities

Sensitive vegetation communities are natural communities and habitats that are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. These resources have been defined by Federal, State, and local conservation plans, policies or regulations. The CDFG ranks sensitive communities as “threatened” or “very threatened” and keeps records of their occurrences in its CNDDB. Sensitive vegetation communities are also identified by CDFG on its List of California Natural Communities Recognized by the CNDDB. Impacts to sensitive natural communities and habitats identified in local or regional plans, policies, regulations or by Federal or State agencies

must be considered and evaluated under the CEQA (CCR: Title 14, Div. 6, Chap. 3, Appendix G).

Regulations for Oak Woodlands Protection

The State Public Resources Code (Section 21083.4) states that if a County determines that a project in its jurisdiction may result in a conversion of oak woodland that would be considered significant under CEQA, then mitigation for this impact is required. The mitigation can include 1) conservation of oaks on the site; 2) replanting oaks (can be used for a maximum of 50 percent of the required mitigation); 3) contribution to the Oak Woodlands Conservation Fund; and/or 4) other mitigations developed by the County.

c. California Native Plant Society

The CNPS publishes and maintains an Inventory of Rare and Endangered Vascular Plants of California in both hard copy and electronic version. The Inventory assigns plants to the following categories:

- 1A – Presumed extinct in California
- 1B – Rare, threatened, or endangered in California and elsewhere
- 2 – Rare, threatened, or endangered in California, but more common elsewhere
- 3 – Plants for which more information is needed
- 4 – Plants of limited distribution

Additional endangerment codes are assigned to each taxa as follows:

1. Seriously endangered in California (over 80 percent of occurrences threatened/high degree of immediacy of threat).
2. Fairly endangered in California (20-80 percent occurrences threatened).
3. Not very endangered in California (<20 percent of occurrences threatened or no current threats known).

Plants on Lists 1A, 1B, and 2 of the CNPS Inventory consist of plants that may qualify for listing, and are given special consideration under CEQA during project review. Although plants on List 3 and 4 have little or no protection under CEQA, they are usually included in the project review for completeness.

B. Potential Impacts and Mitigation Measures

1. Criteria Used For Determining Impact Significance

A project will typically have a significant impact on plants or animals if it meets any of the following criteria:

4.3a Has a substantially 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 the U.S. Fish and Wildlife Service.

4.3b Has a substantially adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service.

4.3c Has a substantially 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.

4.3d Interferes substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedes the use of native wildlife nursery sites.

4.3e Conflicts with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)).

4.3f Results in the loss of forest land or conversion of forest land to non-forest use.

4.3g Conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

4.3h Conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.

2. Project Impacts

The project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, since such ordinances and policies do not exist (Criterion 4.3e). The project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan, since there are no such plans adopted for the project site (Criterion 4.3f).

Special Status Plants

Impact 4.3-A Project development could impact special status plant species, either directly or through habitat modification.

No special status species of plants were found in areas that would be disturbed by the project. However, additional species have been added to the list of special status species since the 2006 surveys were conducted plus species that were searched for in 2006 could have colonized the site since 2006. None of these species was observed during the 2010 surveys. However, the time was not appropriate for these surveys, which should be conducted in the Spring. Also, due to the long-term scope of the project,

special status plant species have the potential to become established within the project area over time. Although no special status species or sensitive resources were located or are expected to be impacted by the proposed project, plants on site could be later specified as special status species. Removing those plants would be a ***potentially significant impact.***

Mitigation Measures

4.3-A.1 Project construction or operation shall not adversely affect special status species of plants. If feasible, surveys for special status species of plants will be conducted by a qualified biologist approved by the County prior to certification of the Final EIR or project approval. Otherwise, surveys will be conducted prior to project-related vegetation removal. New surveys shall be conducted every three years in areas that have not yet been mined. If special status species of plants are found, the plant will be avoided, or, if that is not feasible, the biologist will confer with the Department of Fish and Game to identify suitable mitigation. The applicant will abide by the decision of the Department of Fish and Game concerning the special status species.

Impact Significance After Mitigation

The project is not expected to adversely affect special status species of plants, and the mitigation ensures that no impacts will occur in the future. The mitigation would reduce the impact to a ***less-than-significant*** level.

Special Status Wildlife

Impact 4.3-B Project development could impact special status wildlife species, either directly or through habitat modification.

The current activity and noise levels are likely a limiting factor for most sensitive (and common) wildlife species to potentially roost or nest within the project area. Furthermore, there are few special habitat elements (i.e. water sources, remote snags, large woody debris, etc.) or suitable habitat to support potentially occurring sensitive wildlife species. The potentially available habitat that may be lost is mostly of marginal quality, and overall its loss would be less than significant. In general, given the extensive undeveloped acreage in the vicinity of the project site, the loss of approximately 16 acres of marginal foraging habitat is not likely to impact golden eagles; nor would an approximate loss of 5 acres of marginal habitat be likely to impact the Cooper's and sharp-shinned hawks.

The occasional nighttime operations would cause additional lighting and noise levels beyond those caused by traffic using Highway 101 and Black Bart Drive. The noise level is expected to be comparable to the daytime noise levels. Nocturnal wildlife inhabiting the area are inured to lights and noise from vehicular traffic in the area. It is possible that individual animals would be bothered by this noise and light, but there is ample habitat in the area where the noise and light would not have an effect. The periodic nighttime

operations would have a ***less-than-significant impact*** on nocturnal wildlife in the general area.

Due to the long-term scope of the project, special status wildlife species have the potential to move into or near the project area, over time. Although no sensitive wildlife species are expected to be impacted by the proposed project, it is possible they could be affected in the future, and this is a ***potentially significant impact.***

The project would generate increased demand for water, which would reduce streamflows, thereby adversely affected salmonids. As was described in the Setting section for Section 4.2 (Hydrology) above, the Forsythe Creek Hydrologic Sub Area (HSA) is listed as critical habitat for the California Coastal Chinook Salmon (*Oncorhynchus tshawytscha*), which extends in Forsythe Creek from its confluence with the Russian River to just south of Forsythe Creek's confluence with Mill Creek, which is approximately 5 miles south of the project's Forsythe Creek tributary confluence with Forsythe Creek.

The Forsythe Creek HSA is also listed as critical habitat for the Central California Coast Steelhead *(O. mykiss).* The HSA extends from Forsythe Creek's confluence with the Russian River to a point just south of the confluence of Walker Creek with Forsythe Creek, which is approximately 2 miles south of the project's Forsythe Creek tributary confluence with Forsythe Creek.

The CDFG field inventory of Forsythe Creek noted that salmonid migratory habitat on Forsythe Creek extends from the confluence with the Russian River to a series of natural high gradient boulder falls that form a salmonid migration barrier (i.e., the "Natural Limit to Anadromy"[5]) roughly 0.2 miles downstream of the project tributary's confluence with Forsythe Creek.[91] The two tributaries of Forsythe Creek below the project site are in Reach 4 (as defined in the *Stream Inventory Report, Forsythe Creek* prepared for CDFG). These intermittent tributaries do not support a fishery.

As described in Impact 4.2-B, the project will result in reduction of peak wintertime flows in the upper Forsythe Creek watershed of 1.6% to 2.2% for the 10-year and 100-year storm events, respectively. This percentage reduction in flows would be less at the point where salmonids inhabit the stream (because the area affected would be a smaller percentage of the contributing watershed at that downstream location). It is noted that the most important streamflow for salmonids in Forsythe Creek are dry season flows. The tributary below the quarry is currently dry during this season, so any reduction in the watershed of this tributary would have no impact on dry season flows in the creek. Potential impacts to streamflow, and therefore to salmonids, due to reductions in flow to the streams would be ***less-than-significant***.

The expansion of the quarry activities (nearing the Class III drainage to the south) may further the potential for sedimentation. As was described in Impacts 4.1-E and 4.2-A, project development and operations could adversely affect water quality and increase sedimentation of Forsythe Creek and the Russian River. Implementation of a water

[91] Resources Agency of California, Department of Fish and Game. Stream Inventory Report Forsythe Creek. Report revised April 14, 2006, report completed 2002, assessment completed 1999.

quality protection program, as described in Mitigation Measure 4.2-A.2 provides measures to ensure that water quality criteria are consistent with the Water Quality Plan for the North Coast Region. Thus, with the implementation of the water quality control measures, the project would have a ***less-than-significant impact*** to water quality, as concluded in Impact 4.2-A.

Commenters on the original DEIR expressed concerns that the bio-retention swale would not adequately control potential pollution sources from the asphalt processing facility and that emissions from the asphalt plant would adversely affect water quality and, thereby, salmonids. See the discussion under Impact 4.2 regarding the design and efficacy of the bio-retention swale. It is expected that this swale will adequately reduce water quality impacts of runoff at the asphalt plant to a less-than-significant level. Emissions from the asphalt plant will be within allowable limits as regards effects on humans. There is no evidence that these emissions would settle out in water or on land and be washed to streams in amounts that would significantly impact water quality or salmonids.

Mitigation Measures

All mitigations required for 4.1-E and 4.2-A are required for this impact.

4.3-B.1 As required by law, the project applicant shall not remove nests or den sites of any special status species of wildlife when constructing the project or expanding the quarry. Because special status species may move into the project area in the following years, additional biological surveys will be conducted at least every 3 years to ensure that special status species are not present in the area where vegetation will be removed. The surveys shall be conducted by a qualified biologist, during the spring, in the specific area proposed for vegetation removal. If dens or nest sites of special status species of wildlife are found, the den or nest site will be avoided, or, if that is not feasible, the biologist will confer with the Department of Fish and Game to identify suitable mitigation. The applicant will abide by the decision of the Department of Fish and Game concerning the special status species.

Impact Significance After Mitigation

The project is not expected to adversely affect special status species of wildlife, and Mitigation Measure 4.3-B.1 ensures that no impacts would occur in the future. Previously recommended mitigation measures reduced erosion impacts to a less-than-significant level. Together, these mitigations would reduce the impact to a ***less-than-significant*** level.

Vegetation Loss

Impact 4.3-C Project development would result in the loss of about 24 acres of native vegetation.

Over time, the proposed quarry expansion would result in the removal of approximately 11 acres of Douglas-fir tan-oak forest on the north side of the ridge and approximately 8 acres of chaparral and evergreen forest habitat on the south side of the ridge. Constructing the asphalt processing facility would remove approximately 5 acres of grassland and oak habitat. In addition to these two main components of the project, some vegetation on a total of about one acre will be removed to extend the access road to the asphalt processing facility, reconstruct the road to the water tank, and realign the project driveway. The conversion of this natural vegetation to other uses is not considered significant since there are no special status species nor sensitive habitat types that would be affected other than the small wetland and drainage (and these are addressed in Impact 4.3-D). The remaining property (approximately 600-acres) owned by the applicant and the surrounding area would continue to provide extensive areas of the same and more diverse habitats. Rocks falling from the quarry towards the west, as has occurred in the past, could cause significant damage to approximately 6 sparsely wooded acres of bay forest.

The project includes a Reclamation Plan that would include final reclamation of the project site. The Reclamation Plan has an aim to revegetate the upper slope, upper and lower benches, the floor of the quarry and the entire asphalt processing facility site. The slopes between the quarry benches will be solid rock and too steep to revegetate. Therefore 23.0 acres of the 30.6 acres that will be disturbed on the quarry site will be reclaimed with vegetation, and 4.3 of the 5.7 acres disturbed on the asphalt processing site will be re-vegetated. The end land use will be open space, that is, land used to support native plants and wildlife. The Reclamation Plan is summarized in more detail in Section 3.2 of this EIR. The facts that the site does not contain sensitive vegetation types (other than the small wetland), large amounts of similar habitat exist in the project area, and future reclamation of the site to a vegetation type similar to what currently exists reduce this impact to a ***less-than-significant*** level. However, the Reclamation Plan must be reviewed by the State Office of Mines Reclamation (OMR) to ensure that it complies with all reclamation requirements of SMARA. If it does not comply with SMARA reclamation requirements, this would be a ***potentially significant impact.*** OMR found the original Reclamation Plan for the original project to be inconsistent with certain reclamation requirements. The applicant revised the Reclamation Plan to both address the revised project and the recommendations that OMR submitted on the original plan.

Mitigation Measures

4.3-C.1 The Final Reclamation Plan shall be submitted to the State Office of Mine Reclamation for review. All conditions recommended by OMR during that review shall become part of the final Reclamation Plan for the project.

Impact Significance After Mitigation

The Final Reclamation Plan will replace much of the vegetation that would be removed by the project. The reclaimed quarry floor will provide relatively flat habitat that would contain native vegetation and seasonal ponds, which is expected to provide more wildlife habitat than the steep hillside that would be lost. The remaining loss of common vegetation types is considered to be a ***less-than-significant impact.*** OMR will ensure that the final Reclamation Plan complies with all SMARA requirements for reclamation, and this would reduce the impact to a ***less-than-significant*** level.

Wetlands and Riparian Habitat

Impact 4.3-D Project development could impact wetlands and "waters of the U. S."

Based on the field surveys, developing the project would not impact wetlands. Constructing the section of access road between the existing quarry access and the existing road to the processing facilities site could affect a small 0.04-acre wetland located downslope (north) of that proposed road. This wetland would not be filled or disturbed by project construction. However, it could be adversely impacted if stormwater runoff draining from the new haul road is concentrated causing erosion, or if runoff is intercepted so it cannot enter the wetland.

The project includes relocating the existing access road to the quarry to the west. This will result in the need to fill the existing 410-foot drainage channel that is located southwest of the existing access road. In the future, runoff would be conveyed by a new culvert connecting the existing culverts at either end of this open drainage. This drainage, which has likely formed or deepened due to drainage structures made when constructing Highway 101, does not support an extensive riparian plant community. However, the stream bottom would be considered habitat under the jurisdiction of the Army Corps of Engineers and the California Department of Fish and Game. The channel provides a cool refuge, water source, and a travel route for wildlife.

Potential hydrologic impacts on the small wetland and 1,400 square feet of "waters of the U.S.' constitute a ***potentially significant impact.***

Mitigation Measures

Recognizing that the Department of Fish and Game and the Army Corps would require mitigation for the filled drainage (as well as two small wetlands that will be filled to allow the required mitigation of widening Highway 101 – see Impact 4.3-K below), the applicant, in consultation with the Department of Fish and Game, investigated mitigation options during the project redesign process. It was concluded that the project site did not lend itself to constructing viable replacement wetlands or stream channels and that off-site mitigation would be warranted.[92] In consultation with Department of Fish and Game, a section of Forsythe Creek was identified for improvement to offset the loss of the "waters of the U.S." Figure 3-10 shows the location of the proposed mitigation site.
The proposed mitigation for the stream channel loss includes channel stabilization, enhancement, and channel creation for a section of Forsythe Creek. Mitigation here will include planting of willows, oaks and other vegetation on the adjacent terraces to provide connected stands of trees for pool shading. This will include enhancing approximately 26,750 square feet of the creek section. The enhancement also includes incorporation of two minor side channels that will provide overflow for larger storm events. This proposed mitigation is shown on Figures 3-11 through 3-13.

Existing laws and regulation already require that prior to conducting any work within the stream channel, the applicant will need to apply to the U.S. Army Corps of Engineers for a wetland delineation and permit coverage for filling in the 410-foot long drainage. The

[92] Confirmed at the Agency EIR Scoping Meeting by Rick Macedo, August 17, 2010.

applicant will be required to abide by any conditions required by the Army Corps. Prior to conducting any work within the stream channel, the applicant will be required to obtain a Streambed Alteration Agreement from the California Department of Fish and Game (DFG) and Water Quality Certification from the Regional Water Quality Control Board for filling in the drainage, and the applicant will be required to abide by all conditions set forth in that agreement.

The following mitigations also are required:

4.3-D.1 The applicant shall conduct all improvements set forth on EIR Figures 3-11 through 3-13. The applicant shall prepare a final improvement plan describing how and when these improvements will be done and monitored and the responsibility for follow-up work if monitoring finds that the improvements are failing or not operating as planned. This plan shall be submitted to the Army Corps and DFG when applying for required permits/agreements.

4.3-D.2 When constructing the on-site haul road, no construction shall occur within the wetland between the haul road and Black Bart Drive. Drainage improvements will be incorporated to allow the area above the road that currently drains to the small on-site wetland to continue to do so. Level spreaders or other structures shall be installed below the road to spread runoff before it enters the wetland.

Impact Significance After Mitigation

Improving the section of Forsythe Creek will enhance a natural stream channel. The proposed mitigation will have the following beneficial effects on Forsythe Creek: 1) 9,150 square feet of streambank will be stabilized and planted with willows resulting in less long-term erosion and sedimentation of the creek; 2) check dams will be installed to reduce channel downcutting; 3) 1,800 square feet of low terrace adjacent to the channel will be created to allow bank overflow and will form a seasonal wetland; 4) the riparian zone along the creek will be planted with native trees and understory plants providing an enhanced riparian zone; 5) the new seasonal wetland will be planted with wetland species; and 6) at least 35 oaks will be planted on upper terraces.

It is concluded that these improvements to this Forsythe Creek tributary will provide better riparian habitat than exists along the existing drainage that will be filled. This enhanced riparian and stream habitat will benefit wildlife inhabiting the general area and provide long-term water quality benefits to the creek. The proposed mitigation will reduce the impact to the stream channel to a ***less-than-significant*** level. The two permitting agencies may add additional requirements or revisions to this proposed mitigation plan that they believe are needed to satisfy their permitting requirements.

Mitigation Measure 4.3-D.2 ensures that the small on-site wetland will not be adversely affected by road building, and the impact to the wetland is reduced to a ***less-than-significant*** level.

Oak Woodland

Impact 4.3-E Project development could conflict with the State law regarding oak woodland conversion (Public Resources Code 21083.4).

The project will result in cutting true oak species (*Quercus sp.*). Table 4.3-1 lists the trees over 5 inches in diameter at breast height (DBH). Expansion of the quarry would result in removal of 24 canyon live oaks. Construction of the asphalt plant site and the internal haul road would remove 18 California black oaks, 49 Oregon white oaks, 9 interior live oaks, and 2 canyon live oaks. The project would remove a total of 102 true oaks.[93] Removing these oaks will result in a conversion of oak woodland, and this is a potentially significant impact. Per State Public Resources Code Section 21083.4, mitigation is required for the loss of true oaks that may result in the conversion of oak woodlands. The table also identifies oaks that would be removed to implement EIR-recommended highway widening; the secondary impacts associated with that traffic safety mitigation are described below in Impact 4.3-K.

Table 4.3-1
Project Oak Tree Removals

Size Class (DBH, inches)	Oak Tree Species (*Quercus sp.*) and Project Areas							Total # per Size Class
	California Black Oak (*Q. kelloggii*)		Oregon White Oak (*Q. garryana*)	Interior Live Oak (*Q. wislizenii*)		Canyon Live Oak (*Q. chrysolepis*)		
	Processing Facilities	Highway Widening	Processing Facilities	Processing Facilities	Highway Widening	Processing Facilities	Quarry Expansion	
6 – 10	0	8	1	3	2	0	11	25
12 – 16	3	2	18	4	1	1	5	34
18 – 22	6	2	11	1	0	1	6	27
24 – 28	3	0	2	1	0	0	0	6
30 – 34	2	0	5	0	0	0	1	8
36 – 40	0	0	7	0	0	0	0	7
42 – 46	0	0	2	0	0	0	0	2
48 – 52	1	0	0	0	0	0	0	1
54+	3	0	3	0	0	0	1	7
Total # per Species	18	12	49	9	3	2	24	117

The proposed Reclamation Plan includes replanting various trees and shrubs. That plan has an objective of restoring 65% of the upper quarry slope and the asphalt processing site with an oak woodland consisting of Oregon white oak, black oak, canyon live oak, interior live oak, madrone, and red huckleberry. Twenty percent of these areas would be

[93] The original EIR estimated that 371 true oaks would be removed. The number of trees to be removed is decreased because the quarry expansion is smaller. More importantly, the original survey assumed removal of all trees within a much larger area than would actually be affected by the project. The survey done for this Revised DEIR was based on a clearer demarcation of the area to be disturbed.

replanted with species of the chamise chaparral series, and 15% with grasslands. The quarry benches will be replanted to establish a tanoak woodland series (40% of the benches) and a canyon live oak shrub series (60% of the benches). The reclamation goal for the 18.5-acre quarry floor is to be reclaimed as a 70% (13.0 acres) mixed grasslands, 20% (3.7 acres) canyon oak woodland habitat series and 10% (1.8 acres) tanoak woodland habitat series. The Reclamation Plan would result in planting of substantially more oaks than the 102 oaks that would be removed for the proposed project. However, while some oak planting would occur during construction of the asphalt processing facility, most reclamation would not occur for thirty years. While this eventual reclamation may entirely meet oak mitigation requirements, the impact would remain a ***potentially significant impact.***

Mitigation Measures

State Public Resources Code Section 21083.4 provides four options for mitigating this impact: 1) the use of conservation easements; 2) replanting (cannot fulfill more than one-half of the total mitigation); 3) contributing funds to the State's Oak Woodlands Conservation Fund; and/or 4) other mitigations developed by the County. For this project, the applicant shall do the following:

4.3-E.1 During site preparation for the access road to the asphalt processing facility, the access road to the water tank, and the asphalt processing facility itself, the applicant shall flag the actual area to be graded or disturbed. A qualified biologist shall inventory the species and number of true oaks that will actually be removed or encroached in such a fashion that could lead to future mortality. Similar inventories shall be done when trees are removed for quarry expansion.

4.3-E.2 Plant replacement oaks on the applicant's property (Assessor's Parcel Nos. 147-180-07, & -08 and/or 147-140-07) within three years of project approval or tree removal, whichever is later. The new oaks will be replanted at a ratio of 3:1 for each oak removed. New seedlings will be the same species as the tree removed except that canyon live oak will be used instead of interior live oak. If black oak in the area become infected with SOD, then a non-susceptible species of oak will be used to replace black oak. The oaks shall be fertilized, irrigated, protected, and maintained until they are 5 years old. Any trees dying within that period shall be replanted until there are new live trees at the 3:1 ratio described above on the property that have been alive for at least 7 years. Tree seedlings should be planted no closer than 10 feet apart from other tree seedlings and no closer than 20 feet apart from the trunk of any mature tree. Compacted ground shall be broken to an area three times the diameter of the root ball prior to planting to allow root growth. Trees shall be watered weekly by the property owner in weeks with no natural precipitation (usually April 15 through October 15 of each year) and shall be watered three times per week when temperatures exceed 100 F° for the first three years after planting. During site reclamation, additional oaks will be planted at a 2:1 ratio. So, at least 5 new oaks will be established for each one removed by the end of site reclamation.

It is recommended that the applicant not include planting tanoak as part of site reclamation, given the susceptibility of that species to Sudden Oak Death (SOD). As it is

quite possible that any planted trees may die, these trees would then need to be replanted as part of meeting reclamation performance standards. Unless some manner of protecting trees of this species is developed, it may be more efficient to plant with species of oak not susceptible to SOD.

Impact Significance After Mitigation

The mitigations are consistent with State Public Resources Code Section 21083.4 regarding oak conversion mitigation. Replanting oaks would replace much of the woodland that would eventually be lost. Requiring that this replanting (at the 3:1 ratio) be done soon after tree removal means that by the time the quarry activity is completed, a mature oak woodland would be in place. Also, oaks replanted as part of the Reclamation Plan will provide additional long-term mitigation, so that after reclamation there would be more oaks than currently occur on the site. The mitigations would result in maintenance of oak woodland in the area, and the impact would be reduced to a ***less-than-significant*** level.

Timberland Conversion

Impact 4.3-F Project development would convert Timberland to other uses.

The quarry expansion area contains trees that constitute Timberland as defined by the State. CAL FIRE the California Department of Forestry and Fire Protection) states that before this Timberland can be logged and converted to another use (i.e., a quarry), the applicant will be required to prepare and submit to CAL FIRE, an application for Timberland Conversion (TCP), and will need to prepare and submit a Timber Harvest Plan (THP) in accordance with Subchapter 7, Article 2 of the *Forest Practice Rules.*[94] The THP remains in force for 3 years, with currently up to two 2-year extensions. This means all trees would need to be removed within 7 years, even though it may take up to 30 years before the entire area is actually converted. The alternative is to submit a THP for only the area to be quarried in the first 7 years, and then subsequently seek additional THP approvals.

There is some uncertainty whether removing trees for the project actually constitutes "conversion." The project includes a Reclamation Plan that includes planting new trees at the termination of mining in 30 years. Thus, the site is not being permanently "converted." Nevertheless, CAL FIRE staff states that the project does constitute conversion, and the necessary permit and plan approvals from that agency are required. CAL FIRE states that it would approve a TCP and a THP to remove the trees from the expansion area.[95]

This conversion of timberland is considered a potentially significant impact. However, the impact is mitigated by the requirement that the applicant will need to abide by existing State law regarding timberland conversion and timber harvesting. CAL FIRE will

[94] Jeanette Pedersen, CAL FIRE, personal communication 8/31/10, and Alan Robertson, CAL FIRE, personal communication, 9/3/10.
[95] Alan Robertson, CAL FIRE, personal communication, 9/3/10.

be responsible for approving the TCP and THP(s). Prior to considering the merits of those plans, CAL FIRE will conduct a CEQA review. Typically, CAL FIRE would use the data included in this EIR for its CEQA analysis. However, CAL FIRE may require supplementary analyses to ensure compliance with the State Forest Practice Act and Forest Practice Rules. It is possible that other State agencies (e.g., CDFG and the Regional Water Quality Control Board) that will review the THP will require that the initial THP cover only the area needed for quarry expansion in the first seven years, and that additional THPs would be needed for future tree removal. Until CAL FIRE approves these plans, the applicant cannot remove trees on the proposed quarry expansion area or the asphalt processing facility site. Compliance with existing State law would reduce the timberland conversion impact to a ***less-than-significant*** level, and no further mitigation is required.

Sudden Oak Death

Impact 4.3-G Removal of trees from the site could spread Sudden Oak Death to other areas.

The site is within Board of Forestry and Fire Protection's declared Sudden Oak Death (SOD) Zone. If SOD is currently present on the site or spreads to the site during mining operations, harvesting of infected species and transporting it could spread SOD to other areas. Similarly, removing vegetative debris could spread the disease. New federal Sudden Oak Death (SOD) rules, enforced by the State agencies as well, could affect the demolition, transport and planting of several species occurring on site and in the reclamation planting palette. SOD is caused by a fungus (*Phytophthora ramorum*) and, given the long-term timeline of this project, its presence in Mendocino County could significantly lessen or worsen. Of the plant species occurring in the quarry project envelope P. ramorum has been found in tan oak (*Lithocarpus densiflorus*), black oak (*Quercus kelloggii*), madrone (*Arbutus menziesii*), California buckeye (*Aesculus californica*), California bay laurel (*Umbellularia californica*), California honeysuckle (*Lonicera hispidula*), and manzanita (*Arctostaphylos* ssp.). Mendocino County in its entirety is currently a quarantined County and the rules and regulations governing SOD limit the inter-county transport of both logs and nursery stock without a certificate from the Animal and Plant Health Inspection Service. These rules do not apply to acorns and seeds. A professional arborist shall certify that the trees and shrubs scheduled for removal are free of significant pests and/or disease.

All timber harvesting is required to comply with the most current CAL FIRE and Mendocino County Agricultural Commissioner's requirements for handling wood products and debris within the SOD Zone, including sanitation measures to minimize pathogen spread. As required by CAL FIRE, any Timber Harvest Plan shall include all required SOD mitigations. Compliance with CAL FIRE and County regulations regarding wood handling within the SOD Zone will reduce the risk of spreading SOD off the site to a ***less-than-significant*** level, and no additional mitigation is required.

Wildlife Movement

Impact 4.3-H Project development could interfere with wildlife movement or impede the use of nursery sites.

The quarry expansion area is located on a relatively steep ridge. The south-facing slope is dominated by chaparral and barren areas, and the north-facing slope is dominated by an even-age tanoak forest with minimal vegetative or structural diversity. Additionally, the project area is bordered by Highway 101 to the north and east. Thus, it is unlikely that the quarry expansion site supports any significant wildlife movement corridors, nor would the expansion of the quarry be expected to interrupt wildlife movement on such corridors.

Existing habitats will be reduced, but not substantially fragmented. Any locations used as nursery sites that are provided protection under the law (e.g., under the MBTA) will be protected while in use, and the habitat logged or graded only after the breeding period is completed. As discussed above for wildlife travel, the project would not be expected to significantly disrupt wildlife travel to nursery sites outside the area disturbed by the project.

The site of the proposed asphalt processing facility, located on relatively flat ground, along a habitat edge, and within a small saddle above a seasonal draw draining to Forsythe Creek, probably sustains some local wildlife movement. However, as the project removes only about 5.7 acres of this relatively flat ground, and the remaining property (approximately 600 acres, zoned Rangeland) is to be maintained as open space, wildlife movement will not be significantly interrupted or impacted by the proposed asphalt processing facility. A more probable wildlife corridor, based on topography and habitat elements, would be south of the project area, along Forsythe Creek and the unnamed tributary towards the gentle sloping drainages to the east. This corridor would not be blocked by project activities.

In addition to the 600 acres owned by the applicant, the Golden Rule Church Association property, to the south and east, is placing conservation easements on approximately 4,500 acres of Ridgewood Ranch. The Mendocino Land Trust holds an Oak Woodlands Conservation Easement (±1,690 acres) and a redwood grove conservation easement (33 acres) within the Golden Rule Church Association property. In addition, they are in the process of developing further conservation easements that would provide protection of the proposed "Ridgewood Ranch Conservation Area". The Conservation Area would protect over 60 miles of streams, 2,250 acres of oak woodlands, 208 acres of agriculture land, 900 acres of sustainably managed forests, and at least 19 acres of mature redwood forest.[96] Given the 600+-acre property that includes the project site and conditions in the surrounding area, the impact on wildlife travel and nursery sites is expected to be ***less-than-significant***, and no mitigation is required.

[96] Mendocino Land Trust. July 2005. Ridgewood Ranch Conservation Area Project Summary.

3. Cumulative Impacts

Impact 4.3-I The project in combination with possible future mining of the site could adversely affect biological resources.

An expanded quarry footprint was surveyed and assessed for impacts to biological resources in the original DEIR (see pages 151 to 170 of that report). No special status plants or animals and no wetlands were found within the quarry site proposed at that time.

Additional oaks would need to be removed to further expand the quarry. As discussed under Impact 4.3-E, oaks removed for the current project would be mitigated by Mitigation Measures 4.3-E.1 and 4.3-E.2. These mitigations reduce the loss of oaks and conversion of oak woodland for the project to a less-than-significant level. The project would make a ***less-than-cumulatively considerable*** contribution to the cumulative impact on oaks woodlands. In addition, future mining would be subject to CEQA review, and it is likely that review would require the same or similar mitigations to mitigate for the further loss of oaks due to possible quarry expansion. Similarly, future expansion may need to obtain another TCP and THP to convert timberland to quarry use.

An expanded quarry could result in the loss of nests and nursery sites. However, the project would not combine with these losses since active nests and nursery sites on the project site would have been avoided until after the breeding season. The areas with those nests and nursery sites would have been logged or graded prior to subsequent breeding, so the project would make a ***less-than-cumulatively considerable*** contribution to any cumulative impact on nests and nursery sites.

The expanded quarry could interfere with wildlife movement. The original DEIR assessed this impact for an expanded quarry and found that, as described under Impact 4.3-C, the south-facing slope of the site is dominated by chaparral and barren areas, and the north-facing slope is dominated by an even-age tanoak forest with minimal vegetative or structural diversity. Additionally, the project area is bordered by Highway 101 to the north and east. Thus, it is unlikely that the larger quarry expansion site supports any significant wildlife movement corridors, nor would it be expected to interrupt wildlife movement on such corridors. Furthermore, the existing habitats will be reduced, but not completely fragmented. The project and the possible expanded quarry would have a ***less-than-significant cumulative impact*** on wildlife movement.

The original project included mining to a greater depth than is currently proposed. Potential deepening of the quarry could result in interruptions of flows to Forsythe Creek with corresponding adverse impacts to salmonids and other fish and aquatic life. Any subsequent application for mining that included mining to a level similar to was originally proposed would require additional study of potential impacts to streamflows in Forsythe Creek. The current project does not include deepening the quarry floor, so it would make a ***less-than-cumulatively considerable*** contribution to this possible long-term impact.

Assuming that the future expansion of the quarry also includes continuing use of the asphalt facility and processing site, the potential water quality impacts resulting from this

use would continue into the future. This long-term impact was assessed under Impact 4.2-E, where it was determined that there would be no new cumulative impact that was not identified for the project as proposed.

In summary, the project plus possible future mining of the site would not result in any new significant impacts. Mitigation measures recommended for the project would reduce the project's contribution to the cumulative biological impacts to a ***less-than-cumulatively considerable*** level.

Impact 4.3-J The project, a possible future expanded quarry, and other development in the area could adversely affect biological resources.

There are no other proposed projects in the immediate project area or the watershed of Forsythe Creek. The only cumulative biological impacts that the project, or an expanded quarry, might contribute to would be water quality impacts on Forsythe Creek from the proposed project, any future incidental residential development in that watershed, and timber harvesting in that watershed. The Church of the Golden Rule has an approved Nonindustrial Timber Management Plan (NTMP) for their property which allows the Church to cut a sustained harvest of timber off their property, which contains lands within the Forsythe Creek watershed, A review of the NTMP shows that this harvesting is not expected to have an adverse impact on water quality or biological resources. The timber harvest on the property that includes the project site has been completed.

Though it is not considered a development project. The conservation easements that are being funded and implemented for the adjacent Ridgewood Ranch ensure that a substantial acreage of natural biological habitat will be preserved in the area.

The project, an expanded quarry, combined with adjacent timber harvesting and possible future development in the Forsythe Creek watershed could adversely affect water quality of the stream, thereby adversely affecting salmonid populations. The mitigations recommended for the project in Impacts 4.2-A and 4.3-D would reduce project impacts to wetlands and Forsythe Creek to a less-than-significant level, so the proposed project would make a ***less-than-cumulatively considerable*** contribution to a possible cumulative impact resulting from the project, a possible expanded project, and possible future development in the watershed.

4. Impacts from Implementing Other EIR-Recommended Mitigation Measures

Impact 4.3-K Widening Highway 101 per Mitigation Measure 4.4-B.1 will impact biological resources.

Widening Highway 101 to provide additional northbound and southbound lanes as described in Impact 4.4-B later in this report will require cutting some oaks, removing other vegetation, and filling two small wetlands. As shown on Table 4.3-1, the highway widening will require cutting 12 California black oaks and 3 interior live oaks. It will

require filling two small wetlands as shown on Figure 3-4, one on either side of the highway near the quarry access driveway's intersection with the highway (the wetlands are the shaded areas on Figure 3-4 located just southeast of the intersection of the site access road with Highway 101). These two wetlands total 1,700 square feet, or 0.04 acre. They are described below.

1. The small roadside seep on the northeast slope between the access driveway and the highway, near the intersection of the driveway with the highway. This seep stays moist year round. As a result, the linear ditch at the toe of the seep supports opportunistic wetland vegetation such as nutsedge (*Cyperus eragrostis*) and rush (*Juncus effuses*). Above the ditch, deep rooting willow (*Salix* sp.) shrubs are present but are likely outside the zone that would be considered wetland. This wetland area, that is proposed to be filled, is approximately 0.01 acres.

2. North of Highway 101 and across from the quarry entrance is a wetland approximately one acre in size. It is a linear, road-influenced wetland. Himalayan blackberry (*Rubus discolor*) dominates with small patches of cattail (*Typha latifolia*), a few coyote brush (*Baccharis pilularis)* shrubs, and some rush (*Juncus effuses*). The wetland extends to the north, upslope from the highway with large patches of rush (*Juncus patens*) and a wetter trough with *Juncus ensifolia*. This wetland also stretches to the northwest where it is characterized by mint (*Mentha pulegium*) and annual grasses. This wetland correlates to the *Rubus armeniacus* Semi-Natural Shrubland Stand plant community. The area that may be filled in this wetland is approximately 0.03 acres.

The applicant's proposed mitigation for the 0.04-acre wetland loss includes enlarging and enhancing an existing wetland located downstream of the enhancement area described under Impact 4.3-D. The enhancement will recontour the area to create a larger pooling area for the runoff and incorporate planting on the edge of the existing and in the recontoured area. The enhancement will expand the wetland by about 4,408 square feet. The proposed mitigation is shown on Figure 3-14.

In addition, the reclaimed quarry floor is expected to contain seasonal ponding in the area of the existing retention pond and other areas (since the floor is inclined towards the quarry face). In the future it is possible that new on-site wetlands will become established in this area.

Loss of true oaks and filling these two wetlands are ***potentially significant secondary impacts.***

Mitigation Measures

Mitigation Measures 4.3-E.1 and 4.3-E.2 also apply to this impact. Prior to constructing highway improvements within the two wetlands, the applicant is required to obtain a permit from the U.S. Army Corps of Engineers and approval of a 1602 Lake and Streambed Alteration Agreement from the California Department of Fish and Game. The Corps will require a formal wetland delineation to determine the precise amount of wetland that would be lost. The applicant will be required to abide by all conditions set forth in said permit and agreement. In addition, the following mitigations are required:

4.3-K.1 The applicant shall implement the proposed expansion and improvements of the vernal pool as shown on Figure 3-14. Final improvement plans will be approved by the Army Corps and the Department of Fish and Game, and the applicant shall be responsible for implementing any changes or additions the Corps and/or Department make to the improvement plan. It is expected that the Corps or the Department of Fish and Game will require a functional or qualitative assessment of the vernal pool that will be expanded to ensure that it is considered a "higher resource" than the two small roadside wetlands that would be filled. At least the following additional conditions will apply:

- To ensure success of the vernal pool expansion, a water budget for the given drainage area shall be developed to ensure the site can support a larger pool feature. If it cannot, then runoff from other nearby slopes shall be directed to the vernal pool.

- Prior to construction, baseline data shall be gathered at the vernal pool mitigation site, over multiple hydrologically different years (three years minimum), to determine characteristics such as the size, depth, duration of inundation, slope, and biologic species present before construction. This will ensure existing wetlands are not damaged and provide a reference for the performance of the new wetlands. After construction, monitoring shall occur every year for at least 7 years or until specific performance standards are met.

- Pool expansion shall mimic existing habitat characteristics. Construction plans shall be adjusted based on baseline data collection.

- Maintain the hydrology of the pool after construction by preparing horizontal and vertical relief plans for the contractor-operator. The plan should mimic the existing pool as much as possible as regards the depth, no berm, and the back slope, and ensuring the soil type is continuous. A final plan shall describe all details and operation of the pool.

- Written protocols shall be developed for each stage of construction. Protocols shall cover the collection of baseline data, post construction hydroperiod, and the establishment of vegetation and wildlife.

- Inoculation materials shall be raked from the existing vegetation during the end of the dry season and then spread over the raked constructed pool during the beginning of the wet season.

- A conservation easement shall be established to ensure the vernal pool is protected.

Impact Significance After Mitigation

The recommended mitigation measures will maintain oak woodland in the area and provide replacement wetland habitat. The mitigation site is in a much less disturbed area and a natural pool (as compared to the two wetlands that would be filled, which are likely the results of highway construction). These measures will reduce the secondary

impacts of implementing EIR-recommended traffic mitigations to a ***less-than-significant*** level.

4.4 TRAFFIC AND CIRCULATION

This section presents project impacts on the traffic circulation system. The section was prepared with the technical assistance of Crane Transportation Group who used appropriate (after peer review) data from the following reports prepared by W-trans that were done for the applicant.

1. "Updated Supplemental Traffic Impact Analysis for the Harris Quarry." Unpublished report prepared for project applicant," (February 2010);

2. "Addendum to the Updated Supplemental Traffic Impact Analysis for the Harris Quarry," (April 2010); and

3. "Errata for the Updated Supplemental Traffic Impact Analysis for the Harris Quarry." (February 20110.

These reports also contain all traffic volume figures for each analysis horizon year and each development scenario evaluated in this study. The reports are included in Appendix C.

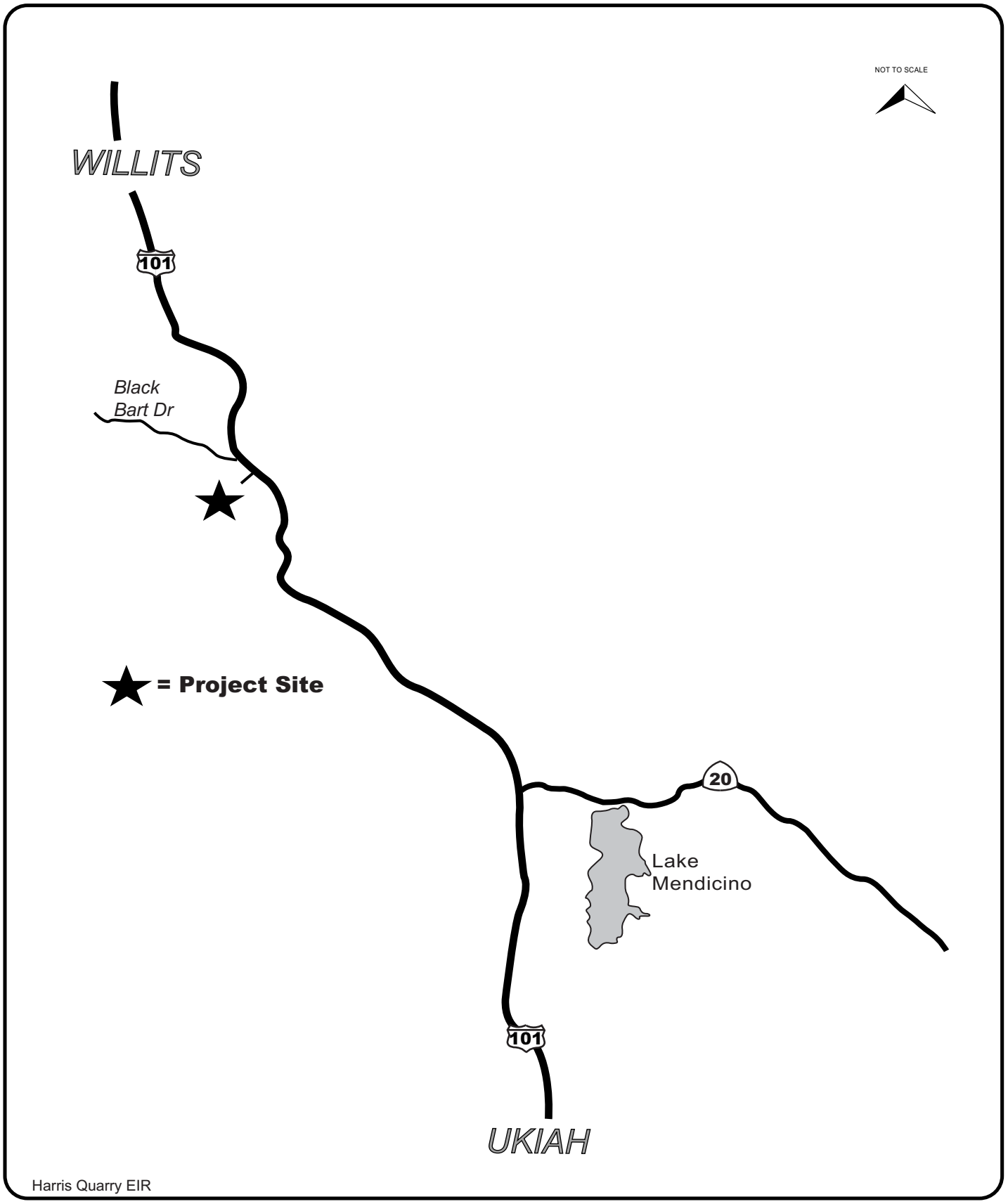
Evaluation was conducted for year 2010, 2014 (both with and without Highway 101 Willits bypass construction), and 2030 horizons. Project traffic impacts were determined for peak production activity for July (peak traffic month on Highway 101) and October (Peak project production month) for each horizon year. In addition, impacts were evaluated for the peak traffic hours on Highway 101 during the time periods of 7:00 to 10:00 AM, 10:00 AM to noon, noon to 4:00 PM and 4:00 to 6:00 PM. Harris Quarry currently operates on weekdays from 7:00 AM to 4:00 PM, with no regular operations on weeknights or weekends. Proposed hours of quarry and asphalt plant operation would be 6:00 AM to 5:00 PM, Monday through Saturday. On rare occasions there could be overnight or Sunday operations, but this would only occur when there would be an emergency need for aggregate. The proposed project has been evaluated in comparison to a baseline of quarry production at the currently permitted level of extraction.

A. Setting

1. Quarry Access

Harris Quarry is located on the west side of the Highway 101 expressway and on the south side of Black Bart Drive (see Figure 4.4-1). Access to the quarry is currently provided via a single access road (Tee) connection to the west side of Highway 101 about 500 feet south of the Highway 101/Black Bart Drive intersection.

Highway 101 in the project vicinity has two travel lanes in each direction. It is an expressway and has intersections with some local roads and major driveways. There are raised medians in some locations. The posted speed limit in the project area is 55 miles per hour, although observed auto speeds are frequently higher than this limit. Highway 101 has an extended uphill grade south to north as it climbs out of the Ukiah Valley. It crests the mountain ridge separating the Ukiah and Willits valleys just north of



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Figure 4.4-1
Area Map

its intersection with Black Bart Drive. Therefore, northbound Highway 101 traffic is climbing an uphill grade through both the Harris Quarry and Black Bart Drive intersections, while southbound traffic is on a downhill grade through both intersections. No left- or right-turn deceleration lanes are provided on the Highway 101 approaches to the Harris Quarry entrance. However, left and right-turn deceleration lanes are provided on both Highway 101 approaches to the Black Bart Drive "Tee" intersection, where all turn movements are also allowed.

Black Bart Drive is a two-lane rural road extending to the west of Highway 101. It has a moderate east-to-west uphill grade and lacks shoulders in most locations. There are also numerous horizontal curves. Black Bart Drive is stop sign controlled on its single lane approach to Highway 101, but flares out at the intersection to permit a right-turning motorist to bypass a vehicle making a left turn. Left- and right-turn deceleration lanes are provided on both Highway 101 approaches to the Black Bart Drive intersection, where all turn movements are also allowed; however, left- and right-turn acceleration lanes are not provided on Highway 101 for turn movements from Black Bart Drive. Land use along Black Bart Drive consists primarily of single family residences and one commercial access near Highway 101. Although traffic from the quarry is not expected to travel on Black Bart Drive, the street was included in the analysis due to its proximity to the quarry entrance and the fact that accelerating or decelerating trucks will interact with vehicles entering or exiting Black Bart Drive.

2. Existing Traffic Volumes

Turn movement counts were conducted by Crane Transportation Group from 7:00 AM to 6:00 PM on Friday, June 9, 2006 at the Highway 101 intersections with Black Bart Drive and the Harris Quarry access road.[97] Count results are presented in Appendix C. Quarry and non-quarry trucks as well as RVs are detailed on the June figures. At the direction of County staff, project traffic impacts have been analyzed for the peak traffic hours on Highway 101 during the following four time periods:

- 7:00 AM – 10:00 AM
- 10:00 AM – Noon
- Noon – 4:00 PM
- 4:00 – 6:00 PM

Based upon count results, the specific weekday peak traffic hours evaluated in this report are as follows:

- 9:00 – 10:00 AM
- 11:00 AM – Noon
- 1:15 – 2:15 PM
- 4:45 – 5:45 PM

[97] These counts remain suitable for the traffic analysis because there have been no substantive changes in quarry operations and no substantive new development in the area served by Black Bart Drive. As such, the County did not require new counts for this EIR.

3. Highway 101 Vehicle Speeds

The posted speed limit on Highway 101 is 65 miles per hour in the vicinity of the Harris Quarry Access (though the posted speed limit is 55 mph about 0.5 miles south of the quarry access). Vehicle speeds were sampled on Highway 101 southerly of Black Bart Drive on March 11, 2008 by W-Trans. Data was collected in both directions northbound (uphill) and southbound (downhill) as well as by inside (number one) and outside (number two) lanes. Table 4.4-1 summarizes statistics of the vehicle speeds measured.

Table 4.4-1
Summary of Vehicle Speeds on US 101

	Northbound		Southbound	
	Inside	**Outside**	**Inside**	**Outside**
Average Speed	66	61	65	60
85th Percentile Speed	70	65	70	66
Pace Speed	60-69	57-66	60-69	58-67
Number Observed	28	67	35	64

Note: All speeds in miles per hour (mph)

Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

As shown in Table 4.4-1, the inside (median or number one) lane had average vehicle speeds approximately five miles per hour faster than those observed in the outside (number two) lane. The 85th percentile of observed speeds is often used to establish the speed limit; however, due to the type of facility, the California Vehicle Code (CVC) limits the speed limit to be not more than 65 miles per hour (CVC §22349). The speed sample was obtained at the location of the quarry driveway. For the purposes of this evaluation, a free flow speed of 65 miles per hour was deemed appropriate for evaluating the need for speed change lanes.

4. Planned Roadway Improvements

There are currently no planned improvements to Black Bart Drive or the Highway 101/Black Bart Drive intersection by the Mendocino County Department of Transportation or Caltrans. The nearest planned and funded project for Highway 101 is the Willits bypass, which will start approximately three miles to the north of the Harris Quarry Access intersection. The bypass has an estimated construction start date of 2012 and is expected to be completed in 2016. If Harris Quarry is selected to provide the aggregate and/or asphalt for this project, the distribution of truck trips entering or exiting the quarry is expected to shift, with more trucks traveling north to the bypass project site.

5. Existing (Base Case) Intersection Operation[98]

a. Analysis Methodology

Transportation engineers and planners commonly use a grading system called level of service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Intersections, rather than roadway segments between intersections, are almost always the capacity controlling locations for any circulation system.

Unsignalized Intersections. Unsignalized intersection operation is also typically graded using the Level of Service A through F scale. LOS ratings for all-way stop intersections are determined using a methodology outlined in the year 2000 TRB *Highway Capacity Manual*. Under this methodology, all-way stop intersections receive one LOS designation reflecting operation of the entire intersection. Average control delay values are also calculated. Intersections with side streets only stop sign controlled (two-way stop control) are also evaluated using the LOS and average control delay scales using a methodology outlined in the year 2000 TRB *Highway Capacity Manual*. However, unlike signalized or all-way stop analysis where the LOS and control delay designations only pertain to the entire intersection, in side street stop sign control analysis LOS and delay designations are computed for only the stop sign controlled approaches or individual turn and through movements. Appendix C provides greater detail about unsignalized analysis methodologies.

Passenger Car Equivalent. Level of service calculations are predominantly based on passenger vehicles, while quarry trip generation is primarily large trucks. Truck trips were factored (adjusted) to a passenger car equivalent (PCE) of one truck being equivalent to four passenger vehicles. The purpose of the PCE is to account for the fact that a truck is considerably larger, slower, and less maneuverable than a standard passenger car. The passenger car equivalent volumes were used in the evaluation of potential project impacts. PCE ratios were applied only to trucks entering or exiting the quarry and not to preexisting truck traffic on Highway 101 that does not interact with the quarry.

b. Minimum Acceptable Standards

County of Mendocino. Mendocino County does not have adopted minimum acceptable levels of service. Based on input from the Mendocino County Department of Transportation and the consulting traffic engineer's experience with other jurisdictions, for purposes of this report, LOS D has been assumed the poorest acceptable operation for stop sign controlled approaches or uncontrolled turn movements at unsignalized public road intersections (such as at the Highway 101/Black Bart Drive intersection). There are no applicable standards for private road unsignalized intersections, such as the Harris Quarry access road connection to Highway 101.

[98] "Base Case" was computed by projecting traffic counts earlier in the year for the peak months used for analysis – July and October.

Caltrans. In the *Guide for the Preparation of Traffic Impact Studies*, Caltrans indicates that they endeavor to maintain operation at the transition from LOS C to LOS D; however, where operation is already below LOS C, the existing measure of effectiveness should be maintained. For public road intersections, this means that the existing control delay should be maintained. Under this criterion, *any* increase in delay would therefore result in a significant impact.

c. Existing (Base Case) Intersection Level of Service

Figure 4.4-2 presents a schematic diagram of existing approach lanes and traffic control at the Highway 101 intersections with the Harris Quarry Access Road and with Black Bart Drive. Harris Quarry Access has a large pavement area where it intersects the highway that provides sufficient room for left- and right-turning vehicles to separate on their approach to Highway 101. In contrast, the Black Bart Drive approach to Highway 101 only has a single lane, with a flare area for one right-turn auto to separate from a left-turning vehicle.

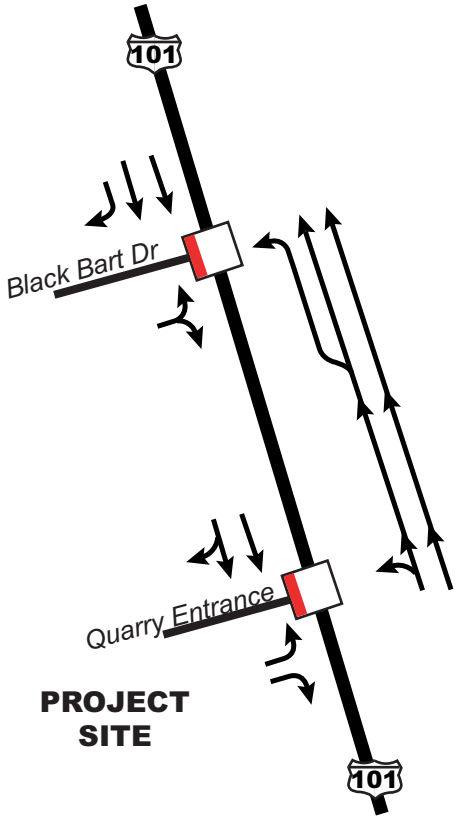
At the Harris Quarry intersection, northbound (uphill) trucks and vehicles on Highway 101 turn into the project site from the passing lane on the expressway. The level of service for this left-turn inbound movement reflects the lack of a left-turn lane on this Highway 101 intersection approach. Also, the lack of a refuge area in the Highway 101 median just north of the Harris Quarry intersection is reflected in the level of service results for left-turn movements from the quarry, where trucks are turning directly into the northbound passing lane.

Table 4.4-2 shows 2010 peak month (July) and October Levels of Service. The table shows that the Black Bart Drive stop sign controlled turn approach to Highway 101 is currently operating at LOS B or C conditions during all peak traffic hours except one during the peak production month. At the Highway 101/Harris Quarry Access intersection, the stop sign controlled approach is operating at LOS B or C conditions during all hours.

6. Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated for the one-mile segment of Highway 101 extending one-half mile in either direction from Black Bart Drive based on the most recent records available from the California Highway Patrol and published in their Statewide Integrated Traffic Records System (SWITRS) reports (January 2004 through December 2008). For the five-year study period, the corridor experienced 16 collisions, translating to a calculated collision rate of 0.52 collisions per million vehicle miles (c/mvm). This is less than the statewide average of 1.65 c/mvm for similar facilities statewide, as indicated in *2007 Accident Data on California State Highways*, California Department of Transportation. One collision, or 6.3 percent of all reported collisions, resulted in a fatality, which is greater than the statewide average of 2.2 percent for similar facilities. However, the 31.3 percent of collisions that resulted in one or more injuries is less than the statewide average of 38.4 percent for similar facilities. Details of the collision data are provided in the W-Trans report.

NOT TO SCALE



Existing & All Future
Base Case Conditions

Harris Quarry EIR

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Figure 4.4-2
Existing and all Future Base Case
Intersection Geometrics and Control

Table 4.4-2
Existing (2010 – Base Case) Intersection Level of Service

Intersection	July	October
Highway 101/Black Bart Drive		
9:00-10:00 AM	C-15.8[(1)]	B-13.3[(1)]
11:00 AM-Noon	D-25.5[(1)]	C-18.9[(1)]
1:15-2:15 PM	C-20.0[(1)]	C-20.4[(1)]
4:45-5:45 PM	C-19.9[(1)]	C-16.2[(1)]
Highway 101/Harris Quarry Entrance		
9:00-10:00 AM	C-15.6[(2)]	B-13.9[(2)]
11:00 AM-Noon	C-21.7[(2)]	C-17.6[(2)]
1:15-2:15 PM	C-23.5[(2)]	C-17.2[(2)]
4:45-5:45 PM	C-20.7[(2)]	C-15.5[(2)]

[(1)] Level of service – control delay in seconds. Black Bart Drive stop sign controlled approach to Highway 101.
[(2)] Level of service – control delay in seconds. Harris Quarry Access stop sign controlled approach to Highway 101.
Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

The original DEIR looked at collision history from 2001 through March 2006. There were no reported accidents over that survey period at the Black Bart Drive intersection and only two reported accidents at the Harris Quarry Access Road intersection. One of the accidents at the Quarry access (in 2003) involved an auto turning right from the Quarry road being rear-ended by a southbound through vehicle. The accident occurred on a Sunday, and was therefore not related to quarrying activities. The other accident involved a northbound truck turning left into the Quarry being rear-ended. During the five-plus year survey period there were four reported accidents on Highway 101 between the two intersections, two involving autos hitting animals and two involving autos hitting objects in the roadway. Note that some of these accidents may be ones reported for the current study period, since the two study periods overlap.

The collision data was further examined to determine what collisions, if any, can be attributed to turning movements at the Harris Quarry driveway. None of the collisions within the study segment were identified as involving large trucks or trucks with trailers. Additionally, none of the collisions during the five-year period were associated with a turning movement at the project driveway.

7. Existing Observed Safety Concerns

a, Lack of Left and Right Turn Deceleration Lanes on the Highway 101 Approaches to the Harris Quarry Access Intersection

The lack of a left-turn deceleration lane on the northbound (uphill) Highway 101 approach to the Harris Quarry entrance results in trucks slowing to 10 to 20 miles per hour in the passing lane of Highway 101 before making a left turn into the quarry. Occasionally, a truck making an inbound left turn must stop due to heavy southbound

traffic. This results in some northbound through traffic making unsafe lane change maneuvers to pull into the travel lane adjacent to the shoulder to bypass the quarry truck.

The lack of a right-turn deceleration lane on the southbound (downhill) Highway 101 approach to the Harris Quarry entrance results in trucks decelerating to 20 to 30 miles per hour in the shoulder lane before turning into the site. This results in some southbound through traffic making unsafe lane change maneuvers to pull into the passing lane to bypass the slower quarry trucks.

The hazard represented by these unsafe lane changes are exacerbated during times of heavy fog or stormy weather, as drivers have less time to register the presence of a truck in their travel lane.

b. Turn Movements by Harris Quarry Trucks Onto Highway 101

Truck turns from the Harris Quarry access road to both northbound and southbound Highway 101 proceed at slow speeds (as the trucks are usually full of aggregate). Based upon observations by Crane Transportation Group, truck turns are frequently made with inadequate gaps in traffic flow on Highway 101 to accept these turns. Vehicles on Highway 101 traveling at 60 to 70 miles per hour (particularly in the southbound downhill direction) must quickly swerve around the trucks that are slowly accelerating. This is particularly an issue for trucks turning left out of the quarry into the uphill passing lane of Highway 101. As mentioned previously, during foggy or stormy conditions, truck turns occur with limited visibility, increasing the traffic hazard of turning trucks. However, it is unlikely that much construction requiring aggregate or asphalt would occur during stormy weather.

8. Acceleration and Deceleration Lanes

An analysis was conducted of whether acceleration and/or deceleration lanes on Highway 101 at the Quarry Access intersection are warranted given base case conditions. Appendix C contains a technical discussion of how this analysis was done; that appendix also contains a discussion of signal warrants. Based on the warrant analysis, a northbound Highway 101 left-turn deceleration lane (for left turns into the quarry), a southbound Highway 101 deceleration lane (for right turns into the quarry), and a northbound acceleration lane on Highway 101 (for left turns from the quarry) would be warranted under baseline conditions. A southbound Highway 101 right-turn acceleration lane (for right turns out of the quarry) would not be warranted under base case conditions.

The northbound acceleration lane on Highway 101 for left turns from the quarry would provide refuge for vehicles turning left out of the Quarry Access driveway. This acceleration lane would provide space for turning vehicles to reach or at least approach free-flow speeds on Highway 101, therefore reducing the impact on through traffic and increasing the frequency of acceptable gaps for turning. This acceleration lane would be at least 1,410 feet in length, which would extend beyond Black Bart Drive and have a secondary benefit of providing refuge for vehicles turning left out of Black Bart Drive.

9. Recommended Improvements for Existing (Base Case) Conditions

The following improvements are needed to address baseline safety hazards:

- Highway 101 Northbound Approach – Provide a left-turn deceleration/storage lane on Highway 101 at least 470 feet in length.

- Highway 101/Southbound Approach – Provide a right-turn deceleration/storage lane on Highway 101 at least 400 feet in length.

- Highway 101 Northbound Departure – Provide a speed change acceleration lane for left turns from the project site extending at least 1,410 feet in length (which would extend through and north of the Black Bart Drive intersection) as well as a 300-foot taper (total length 1,710 feet).

- Highway 101 Southbound Departure – Provide a full length 1,090-foot speed change/acceleration lane for right turns from the project site as well as a 300-foot taper (total length of 1,390 feet). Though no lane is theoretically warranted, observations of truck driver turns and their disruption to the flow of traffic on southbound Highway 101 indicate the need for the full acceleration lane for baseline conditions.

Table 4.4-3 shows the Level of Service for Base Case conditions for peak production for July and October in 2010, 2014, and 2030. The table shows the Levels of service with and without recommended highway improvements.

Table 4.4-3
US 101/Harris Quarry Access Base Permit Level of Service Calculations – Peak Production

Condition	Production Period	9-10 AM		11 AM-noon		1:15-2:15 PM		4:45-5:45 PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2010 Base Permit	July	15.6	C	21.7	C	23.5	C	20.7	C
Mitigated (turn lanes)	*July*	*13.0*	*B*	*15.3*	*C*	*15.7*	*C*	*14.7*	*B*
2010 Base Permit	October	13.9	B	17.6	C	17.2	C	15.5	C
Mitigated (turn lanes)	*October*	*12.2*	*B*	*13.8*	*B*	*13.5*	*B*	*12.7*	*B*
2014 Base Permit	July	16.6	C	24.11	C	26.5	D	23.0	C
Mitigated (turn lanes)	*July*	*13.5*	*B*	*16.1*	*C*	*16.6*	*C*	*15.4*	*C*
2014 Base Permit	October	14.5	B	19.0	C	19.0	C	18.6	C
Mitigated (turn lanes)	*October*	*12.5*	*B*	*14.4*	*B*	*14.0*	*B*	*13.2*	*B*
2014 Base Permit w/Bypass	July	19.4	C	30.5	D	31.6	D	23.0	C
Mitigated (turn lanes)	*July*	*14.9*	*B*	*18.3*	*C*	*18.3*	*C*	*15.4*	*C*
2014 Base Permit w/Bypass	October	15.4	C	20.9	C	22.4	C	16.6	C
Mitigated (turn lanes)	*October*	*13.1*	*B*	*15.2*	*C*	*15.7*	*C*	*13.2*	*B*
2030 Base Permit	July	22.0	C	**39.6**	**E**	**45.4**	**E**	**36.8**	**E**
Mitigated (turn lanes)	*July*	*15.6*	*C*	*19.9*	*C*	*20.7*	*C*	*18.8*	*C*
2030 Base Permit	October	17.7	C	26.7	D	26.2	D	22.3	C
Mitigated (turn lanes)	*October*	*14.0*	*B*	*17.0*	*C*	*16.5*	*C*	*15.2*	*C*

Notes: Delay is in average number of seconds per vehicle; LOS = Level of Service; **Bold** = deficient operation
Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

B. Potential Impacts and Mitigation Measures

1. Criteria Used For Determining Impact Significance

A project-related traffic impact or cumulative traffic impact is considered to be significant if:

4.4a It conflicts with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways. For purposes of this EIR, the impact would be significant if a Base Case stop sign-controlled turn movement or approach at an unsignalized side street stop sign controlled intersection deteriorates to LOS E operation (or worse) due to the project with the addition of project traffic.

4.4b It conflicts with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and

relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

4.4c Substantially increases hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

4.4d Conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreases the performance or safety of such facilities.

4.4e Results 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.

4.4f Results in inadequate emergency access.

2. Project Impacts

The project is served by Highway 101, which has no pedestrian or bicycle facilities. There is no public transit available to the project site. Therefore, any impact per Criterion 4.4d would be less-than-significant. The project would not affect air traffic in the area, and air traffic would not pose a risk to project operations, so there is no impact per Criterion 4.4e. The project includes two access connections (i.e., the main driveway and an emergency access to Black Bart Drive) with the public road system and has adequate emergency access per Criterion 4.4f.

a. Project Trip Generation

The Harris Quarry project would allow the permitted annual extraction to increase to 200,000 cubic yards and would add an asphalt concrete (AC) batch plant capable of producing 150,000 tons annually. The project proposal also includes the importation of 10,000 tons of material for recycling, the analysis was based on importation of 10,000 cubic yards. Since 10,000 tons of material for recycling is expected to yield approximately 5,000 to 6,000 cubic yards of material, the analysis was based on a considerably higher volume of recycling material, so it provides conservative results of the project's truck trip generation and actual potential impacts. Additionally, while it is anticipated that the imported material will be brought in on trucks that will be used to export other material, therefore resulting in no additional trips, to provide a conservative analysis it was assumed that the recycle material will be exported as part of the aggregate for sale. Additional assumptions specific to each product type and the two peak months are shown in Table 4.4- 4.

Table 4.4-4
Trip Generation Assumptions with Proposed Project

Source	Annual Production	Percent of Annual Production in:	
		July	October
Material Processed			
Material Mined	200,000 cy	n/a	n/a
Increased Material Volume by Bulking	48,000 cy	n/a	n/a
Recycle Material Imported	10,000 cy	9.4%	12.2%
Total Material Processed	***258,000 cy***		
Material Distributed			
Aggregate Production For Sale	162,520 cy	9.4%	12.2%
Aggregate transferred to Willits for PCC	37,200 cy	10.0%	15.8%
Asphalt Concrete Production	58,280 cy	12.0%	17.0%
Total Material Distributed	***258,000 cy***		

Source: W-Trans Errata for Updated Supplemental Traffic Impact Analysis for the Harris Quarry, April 2010

In addition, the quarry will generate truck trips for deliveries as well as clients or other quarry visitors who will arrive by personal vehicle. As with the Base Permit conditions, one inbound and one outbound truck trip was added to each hour between 7:00 AM and 4:00 PM to account for delivery of goods or other services. This is expected to provide a conservative analysis as it would result in a greater number of delivery trucks than would be expected in a typical month. Using the assumptions indicated, trips on the average weekday and monthly peak day were derived for the months of July and October. An average of 214 daily two-way truck trips and a peak of 310 daily two-way truck trips would be expected during the month of July. For October, 286 daily two-way truck trips would be expected on average, while 412 daily two-way truck trips would be expected on a peak day.

Construction activities typically begin in the morning between 7:00 and 8:00, reaching peak activity near 9:00 AM. This peak continues until about noon, then reduces slightly until 3:30 or 4:00 PM. Limited quarry activity occurs after 4:00 PM and none after 5:00 PM. Using the hourly trend data from the EIRs for the Canyon Rock and Blue Rock quarries in Sonoma County, hourly truck trips were projected for the average and peak days in July and October. Table 4.4-5 summarizes the projected truck trips entering and leaving the Harris Quarry during these peak months. On occasion, the quarry would be expected to operate overnight or on weekends due to an urgent need for AC or aggregate, usually due to a natural disaster, or to satisfy the need for AC or aggregate for overnight road work as requested by Caltrans or other governmental agency. Since overnight and weekend operations are rare and do not represent typical operations, they were not included in this analysis.

Table 4.4-5
Projected Truck Trips for Project Production (200,000 cy Mined)

Time	Aggregate				Asphalt Concrete				Transfer to Willits				Other Trucks			
	Average Day		Peak Day		Average Day		Peak Day		Average Day		Peak Day		Average Day		Peak Day	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
July																
6:00 – 7:00 AM	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:00 – 8:00 AM	6	6	8	9	4	3	4	3	2	1	2	1	1	1	1	1
8:00 – 9:00 AM	7	7	11	11	3	3	5	4	2	1	2	1	1	1	1	1
9:00 – 10:00 AM	7	7	11	11	3	3	5	5	1	1	2	2	1	1	1	1
10:00 – 11:00 AM	7	7	11	11	3	3	5	5	1	1	2	2	1	1	1	1
11:00 AM – Noon	7	7	11	11	3	3	5	5	1	1	2	2	1	1	1	1
Noon – 1:00 PM	6	6	10	10	3	3	4	4	1	1	2	2	1	1	1	1
1:00 – 2:00 PM	6	6	8	8	2	2	4	4	1	1	2	2	1	1	1	1
2:00 – 3:00 PM	6	6	8	8	2	2	3	4	1	1	2	2	1	1	1	1
3:00 – 4:00 PM	6	6	8	8	2	2	3	4	1	2	1	2	1	1	1	1
4:00 – 5:00 PM	2	3	3	3	1	2	0	1	0	1	0	1	0	0	0	0
5:00 – 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total July Trips	**61**	**61**	**90**	**90**	**26**	**26**	**39**	**39**	**11**	**11**	**17**	**17**	**9**	**9**	**9**	**9**
October																
6:00 – 7:00 AM	1	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0
7:00 – 8:00 AM	7	8	11	11	4	4	5	5	2	1	3	3	1	1	1	1
8:00 – 9:00 AM	10	10	14	14	5	4	7	6	2	2	4	3	1	1	1	1
9:00 – 10:00 AM	10	10	14	14	4	4	7	7	2	2	3	3	1	1	1	1
10:00 – 11:00 AM	10	10	14	14	4	4	7	7	2	2	3	3	1	1	1	1
11:00 AM – Noon	10	10	14	14	4	4	7	7	2	2	3	3	1	1	1	1
Noon – 1:00 PM	8	8	12	12	4	4	6	6	2	2	3	3	1	1	1	1
1:00 – 2:00 PM	7	7	11	11	3	3	5	5	2	2	2	2	1	1	1	1
2:00 – 3:00 PM	7	7	11	11	3	4	5	5	2	2	2	2	1	1	1	1
3:00 – 4:00 PM	7	7	10	11	3	4	4	5	2	2	2	2	1	1	1	1
4:00 – 5:00 PM	2	2	3	4	1	2	1	2	0	1	1	2	0	0	0	0
5:00 – 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total October Trips	**79**	**79**	**116**	**116**	**37**	**37**	**55**	**55**	**18**	**18**	**26**	**26**	**9**	**9**	**9**	**9**

Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

b. Trip Distribution

The projected distribution of trips to and from the Harris Quarry under current aggregate production levels is 45 percent to/from the north and 55 percent to/from the south on Highway 101, which is consistent with the measured driveway volumes. However, the increased production potential of the Harris Quarry will cause redistribution of trips from all quarries in the County and will result in a different distribution of trips to and from the Harris Quarry along Highway 101. With the proposed project, the distribution of trips is projected to shift to 35 percent to/from the north and 65 percent to/from the south. Trips destined for the concrete plant in Willits would all travel to/from the north. In addition, an equal number of employees was projected to be coming from and returning to the north and south.

If Harris Quarry is selected to provide aggregate and/or AC for the Willits Bypass construction, it is expected that a greater portion of quarry-generated traffic will be destined to the north. For this condition, it is estimated that 75 percent of trips will be to/from the north with the remaining 25 percent going to/from the south for base permit conditions and 60 percent to/from the north and 40 percent to/from the south for project conditions. These trip distribution assumptions are summarized in Table 4.4-6.

Table 4.4-6
Trip Distribution

Condition	Percent North	Percent South
Base	45	55
Base w/By-pass Construction	75	25
Project	35	65
Project w/ By-pass Construction	60	40
Aggregate to Concrete Plant in Willits	100	0

Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

c. Analysis Years and Conditions

At County of Mendocino request, project impacts have been analyzed for 2010, 2014 and 2030 horizons for the scenarios listed below. Year 2014 conditions have been evaluated both with and without the Willits bypass under construction. While this construction would alter project traffic distribution and volumes, it would not be expected to change background (Base) traffic volumes on Highway 101 in the vicinity of Black Bart Drive and the Harris Quarry.

To evaluate the highest impact situations, traffic generated by the quarry was evaluated for July, when traffic on Highway 101 is at its highest, and October, when quarry production peaks. Conditions evaluated were:

- ***2010 Project:*** Conditions with the Harris Quarry project added to 2010 traffic volumes (baseline conditions that were described in the Setting section) are evaluated in this scenario.

- ***2014 Base Permit With Willits Bypass Aggregate Supplied by Harris Quarry:*** This scenario describes operating conditions under projected 2014 traffic volumes together with the operation of the Harris Quarry at current permitted levels (75,000 CY per year); it assumes that Harris Quarry is selected to supply material for the Willits Bypass project.

- ***2014 Project With Willits Bypass Aggregate Supplied by Harris Quarry:*** This scenario describes operating conditions under projected 2014 traffic volumes including the proposed Harris Quarry project; it assumes that Harris Quarry is selected to supply the material for the Willits Bypass project.

- ***2014 Base Permit and Willits Bypass Aggregate Not Supplied by Harris Quarry:*** This scenario describes operating conditions under projected 2014 traffic volumes together with the operation of the Harris Quarry at current permitted levels; it assumes that Harris Quarry is not selected to supply material for the Willits Bypass project.

- ***2014 Project With Willits Bypass Aggregate Not Supplied by Harris Quarry:*** This scenario describes operating conditions under projected 2014 traffic volumes including the Harris Quarry project; it assumes that Harris Quarry is not selected to supply material for the Willits Bypass project.

- ***2030 Base Permit:*** This scenario is an evaluation of operating conditions under projected 2030 traffic volumes with operation of the Harris Quarry at current permitted levels.

- ***2030 Project:*** This scenario is an evaluation of operating conditions under projected 2030 traffic volumes together with the Harris Quarry project.

d. Projected Local Roadway System Base Case (Without Project) Traffic Volumes

Caltrans District 1 has projected that volumes on Highway 101 in the project vicinity will grow by 50 percent over the 20-year period from 2006 to 2025. Likewise, County of Mendocino Planning staff has directed that volumes on Black Bart Drive would grow at the same rate for analysis purposes. The 50 percent growth in traffic was projected to occur by 2025, and year 2010 and 2014 volumes were developed using a straight line growth projection between current and projected 2025 volumes.

Typically, travel demand forecasting is completed for about a 20-year horizon. In the case of Highway 101 within the study area, the most recent forecasting for both Caltrans and the County of Mendocino was completed in 2006, meaning that current projections extend to 2025. A 2030 horizon year has also been developed for analysis purposes, which is beyond current Caltrans and County of Mendocino forecasting and beyond the typical 20-year forecasting horizon. In order to project traffic volumes for 2030, the same annual growth rate was applied that was used to project the 2010 and 2014 volumes. It should be noted that since this is beyond the typical forecasting horizon, the reliability of these projected traffic volumes is unknown and may vary based on changes in area

demographics and travel patterns that cannot be accounted for at this time. Base volumes for each horizon year are presented in the W-Trans report.

Projected Quarry Base Permit Traffic Volumes

Analysis of future year circulation system operation takes into account the peaking characteristics of both the local roadway traffic volumes as well as traffic levels associated with quarrying operations.

Traffic Seasonal Variation

The primary factor related to the number of truck trips into and out of a quarry facility is the demand for aggregate and AC, which is highly influenced by the season and the level of construction activity. Demand will vary not only monthly, but also from day to day and hour to hour. Based upon input from the applicant as well as EIRs for other quarry expansions, October has the highest level of production – see Appendix C.

Local Roadway Traffic Seasonal Variation

Traffic levels on Highway 101 vary significantly throughout the year. Findings from the closest Caltrans count station to the project site are presented in Appendix C. That appendix describes the relationship between peak and average production months together with the variations in traffic volumes on Highway 101 as a percentage of average production and volume. Using these relationships, traffic volumes for July and October were developed based on traffic volume counts conducted near the quarry entrance.

Intersection Level of Service Impacts

Impact 4.4-A The project would increase traffic volumes at the intersections of Highway 101 with Black Bart Drive and the quarry access.

As shown in Tables 4.4-7 and 4.4-8, the project-generated traffic would not decrease the Level of Service of either intersection in 2010 to an unacceptable level. The project would have a ***less-than-significant impact*** on intersection operations, and no mitigation is required per this significance criterion. See subsequent impact discussions about cumulative impacts in 2014 and 2030.

Table 4.4-7
US 101/Harris Quarry Access Project Level of Service Calculations – Peak Production

Condition	Production Period	9-10 AM		11 AM-noon		1:15-2:15 PM		4:45-5:45 PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2010 Project	July	16.8	C	24.5	C	26.2	C	21.0	C
Mitigated (turn lanes)	*July*	*13.6*	*B*	*16.1*	*C*	*16.4*	*C*	*14.8*	*B*
	October	15.0	C	19.7	C	18.6	C	15.7	C
Mitigated (turn lanes)	*October*	*12.8*	*B*	*14.7*	*B*	*14.1*	*B*	*12.8*	*B*
2014 Project	July	18.0	C	28.0	D	30.3	D	23.4	C
Mitigated (turn lanes)	*July*	*14.1*	*B*	*17.0*	*C*	*17.4*	*C*	*15.5*	*C*
	October	15.8	C	21.6	C	20.3	C	16.8	C
Mitigated (turn lanes)	*October*	*13.2*	*B*	*15.3*	*B*	*14.7*	*B*	*13.2*	*B*
2014 Project w/Bypass	July	21.1	C	**36.9**	**E**	**39.3**	**E**	23.4	C
Mitigated (turn lanes)	*July*	*15.4*	*C*	*19.4*	*C*	*19.6 f*	*C*	*15.5*	*C*
	October	17.7	C	26.0	D	24.8	C	16.8	C
Mitigated (turn lanes)	*October*	*14.2*	*B*	*16.9*	*C*	*16.3*	*C*	*13.2*	*B*
2030 Project	July	25.0	D	**55.4**	**F**	**63.0**	**F**	**38.0**	**E**
Mitigated (turn lanes)	*July*	*16.5*	*C*	*21.7*	*C*	*22.3*	*C*	*19.1*	*C*
	October	20.0	C	33.8	D	30.9	D	22.7	C
Mitigated (turn lanes)	*October*	*14.9*	*B*	*18.4*	*C*	*17.5*	*C*	*15.3*	*C*

Notes: Delay is in average number of seconds per vehicle; LOS = Level of Service; **Bold** = deficient operation
Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

Safety Impacts

Impact 4.4-B **The project would increase traffic turning in and out of the project access, and this would increase the existing safety hazard in the area.**

As shown in Table 4.4-5, the project increases the number of trucks turning into and out of the project access. On an average July day, about 13 trucks an hour would enter and leave the quarry. This correlates to 13 left turns (either a left turn in or out) per hour, or one left turn into the quarry about every 10 minutes and one left turn out about every 8.5 minutes, On an average day during the quarry peak production in October, 13-17 trucks would enter and leave per hour. On peak days, the number of trucks would increase to about 19 per hour in July and 25 per hour in October. During these peak October days, which would occur infrequently, there would be a truck turning left into the quarry on an average of every 5.5 minutes, and one turning left out of the quarry about every 4.4 minutes.

Table 4.4-8
US 101/Black Bart Drive Project Level of Service Calculations – Peak Production

Condition	Production Period	9-10 AM		11 AM-noon		1:15-2:15 PM		4:45-5:45 PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2010 Project	July	16.2	C	27.6	D	20.5	C	19.7	C
Mitigated (turn lanes)	*July*	*13.3*	*B*	*17.3*	*C*	*14.6*	*B*	*14.3*	*B*
	October	13.7	B	19.6	C	21.0	C	15.0	B
Mitigated (turn lanes)	*October*	*12.1*	*B*	*14.7*	*B*	*15.1*	*C*	*12.5*	*B*
2014 Project	July	17.2	C	32.4	D	23.2	C	21.8	C
Mitigated (turn lanes)	*July*	*13.9*	*B*	*18.6*	*C*	*15.4*	*C*	*15.1*	*C*
	October	14.2	B	21.7	C	20.6	C	16.2	C
Mitigated (turn lanes)	*October*	*12.4*	*B*	*15.4*	*C*	*15.9*	*C*	*13.0*	*B*
2014 Project w/Bypass	July	17.7	C	33.6	D	23.7	C	22.5	C
Mitigated (turn lanes)	*July*	*14.0*	*B*	*18.9*	*C*	*15.6*	*C*	*15.1*	*14.0*
	October	14.6	B	22.5	C	24.3	C	16.2	C
Mitigated (turn lanes)	*October*	*12.6*	*B*	*15.7*	*C*	*16.2*	*C*	*13.0*	*B*
2030 Project	July	23.8	C	**72.6**	**F**	**42.9**	**E**	**40.5**	**E**
Mitigated (turn lanes)	*July*	*16.3*	*C*	*25.1*	*D*	*19.6*	*C*	*19.6*	*C*
	October	17.6	C	34.4	D	40.0	E	22.6	C
Mitigated (turn lanes)	*October*	*13.9*	*B*	*19.0*	*C*	*19.9*	*C*	*15.2*	*C*

Notes: Delay is in average number of seconds per vehicle;, LOS = Level of Service; **Bold** = deficient operation
** = greater than 120 seconds of average delay

Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

The increase in truck traffic aggravates the existing situation where turning trucks pose a safety hazard for other drivers using Highway 101. The absence of any acceleration, deceleration, or turn lanes at the project access driveway causes potential conflicts between drivers with the potential for accidents. Numerous commenters on the original Draft EIR offered substantial testimony regarding the traffic hazards posed by existing quarry use. Despite the fact that there are no records of accidents in the past five years involving trucks near the access driveway, there are many reports of "near misses" and of accidents occurring in years prior to 2004.

Project impacts were assessed to determine whether acceleration and deceleration lanes are warranted. As shown in Table 4.4-9, acceleration and deceleration lanes needed for baseline conditions are also needed for the project. In addition, the right-turn acceleration taper is warranted for the project. The project would have a ***potentially significant impact.***

In addition, to ensure that this analysis of traffic impacts (as well as the analysis of several other impacts in this EIR) remains accurate and impacts do not become worse than described herein, a method of monitoring quarry production is needed.

Table 4.4-9
Acceleration/Deceleration Lane Warrants

Scenario	Northbound Left Turn Deceleration Lane	Northbound Acceleration Lane	Southbound Right Turn Deceleration Lane	Southbound Acceleration Lane
Baseline (Existing)Conditions	Warranted	Warranted	Taper only warranted	No lane or taper warranted
Baseline (Existing) Plus Project	Warranted (267-300% volume increase)	Warranted (100-133% volume increase)	Taper only warranted (100-133% volume increase)	Taper warranted (267-300% volume increase)
2014 Baseline (Without Project)	Not Warranted	Warranted	Taper only warranted	No lane or taper warranted
2014 (With Willits Bypass) (With Project)	Warranted (400-600% volume increase	Warranted (100-150% volume increase)	Taper only warranted (100-150% volumes increase)	Taper warranted (400-600% volumes increase)
2014 (Without Willits Bypass) (With Project	Warranted (267-300% volume increase)	Warranted (100-133% volume increase)	Taper only warranted (100-133% volume increase)	Taper warranted (267-300% volume increase)
2030 Baseline (Without Project)	Warranted	Warranted	Taper only warranted	Taper only warranted
2030 (With Project)	Warranted (267-300% volume increase)	Warranted (100-133% volume increase)	Taper only warranted (100-133% volume increase)	Taper only warranted (267-300% volume increase)

Source: W-Trans
Reviewed and compiled by: Crane Transportation Group

Mitigation Measures

4.4-B.1 The applicant shall construct the following improvements prior to increasing aggregate production or selling asphalt:

- Highway 101 Northbound Approach – Provide a left-turn deceleration/storage lane on Highway 101 at least 470 feet in length.

- Highway 101/Southbound Approach – Provide a right-turn deceleration lane on Highway 101 at least 400 feet in length.

- Highway 101 Northbound Departure – Provide a speed change acceleration lane for left turns from the project site extending at least 1,410 feet in length (which would extend through and north of the Black Bart Drive intersection) as well as a 300-foot taper (total length 1,710 feet).

- Highway 101 Southbound Departure – Provide a speed change/acceleration lane for right turns extending at least 1,090 feet from the project site as well as a 300-foot taper (total length of 1,390 feet). Although only a 300-foot-long acceleration taper is theoretically warranted, observations of truck driver turns and their disruption to the flow of traffic on southbound Highway 101 indicate the need for the full acceleration lane with Base volumes.

- A lighted sign with a flashing beacon (with a solar panel) that warns southbound Highway 101 travelers of slow and turning trucks shall be placed on the west side of Highway 101 about 925 feet north of the project access driveway. A similar sign and beacon that warns northbound Highway 101 travelers shall be placed on the east side of Highway 101 south of the project access driveway, at a distance that meets Caltrans' requirements.

4.4-B.2 Project-generated traffic shall not result in unsafe operational conditions near the project site as determined by the Mendocino County Department of Transportation and Caltrans. To ensure conformance with this performance standard, the following shall be done:

- Traffic operational and accident conditions shall be monitored at the Highway 101/Harris Quarry Access and Highway 101/Black Bart Drive intersections every two years after project approval. Counts and evaluation shall be conducted during both July and October. The applicant shall fund each study, and the County shall select the firm to conduct the monitoring. Filming of traffic counts and truck driver behavior will be done to provide a defensible record of actual operations.

- If a monitoring report indicates a safety or operational problem at either intersection, an evaluation will be conducted of potential additional mitigation measures that should be considered for implementation. Measures may include: 1) limits on how many trucks can be loaded during peak hours; 2) limits on trucks making left turns in and/or out of the access driveway during peak hours; and 3) provision of a partial or full interchange at the Harris Quarry Access intersection and the possible connection of Black Bart Drive to that new interchange in conjunction with elimination of the Highway 101/Black Bart Drive intersection. If the County and Caltrans agree that such operational changes and/or highway improvements are warranted, then they shall be installed within three years. The applicant shall be responsible for paying its fair share (as determined by Caltrans and the County) of the improvements.

- Sufficient right-of-way shall be maintained at the Highway 101/Harris Quarry Access intersection to provide a partial or full interchange, if ever required.

4.4-B.3 Aggregate production and project-generated traffic shall not exceed the levels predicted and assessed in this EIR. Every three (3) years, an aerial survey of the site shall be submitted to the Department of Planning and Building Services to evaluate the volume of material extracted during the 3-year period. The survey shall include topographic mapping developed from aerial photos taken in such a manner as to clearly show the full extent of the extraction area. The aerial survey aerial shall delineate the limits of extraction for the previous 3 years. A report shall be prepared by a licensed engineer or land surveyor or photogrammetrist, and shall quantify the extraction volume based on the aerial survey. Photos and topographic mapping shall include a standard reference scale and north arrow, and shall be of size and quality acceptable to the Department of Planning and Building Services. A baseline aerial photo and topographic map shall be taken and submitted to the Department of Planning and Building Services within 90 days of approval of this permit."

Impact Significance After Mitigation

Left Turns Into Project Driveway From Northbound Highway 101

The project's proposed left-turn deceleration lane on the northbound Highway 101 approach to the quarry entrance would significantly reduce existing safety issues associated with quarry trucks slowing and then turning left across the southbound through lanes into the quarry from the high speed travel lane of the expressway.

Right Turns Into Project Driveway From Southbound Highway 101

The project's proposed right-turn deceleration lane on the southbound Highway 101 approach to the quarry entrance would reduce existing safety issues associated with quarry trucks slowing and turning right into the quarry from the travel lane adjacent to the shoulder (which requires slowing significantly in a travel lane where speeds are 60 to 70 miles per hour).

Right Turns From Project Driveway to Southbound Highway 101

The recommended southbound acceleration lane would reduce the existing safety issue associated with slow-moving quarry trucks entering the travel lane adjacent to the shoulder (which requires slowing significantly in a travel lane where speeds are 60+ miles per hour).

Left Turns from the Project Driveway To Northbound Highway 101

The proposed refuge area in the Highway 101 median north of the quarry access will greatly facilitate left turns from the quarry and make conditions much safer than existing operations.

The one potential area of vehicle conflict that would remain is for northbound drivers wanting to turn left onto Black Bart Drive potentially being confronted with slow moving trucks that have entered the northbound acceleration lane (which is also the northbound left-turn lane onto Black Bart Drive) in the area where these drivers need to move left out of the fast lane to the left-turn lane. When this occurs, the drivers needing to turn left may need to rapidly reduce speed in order to pull in behind the truck. Conversely, some drivers might opt to maintain speed and pull into the left-turn lane ahead of the truck. The truck would then need to pull around the turning or stopped vehicle, or slow or pull around the stopped vehicle. Based on field observations of the frequency of left turns onto Black Bart Drive and the frequency of trucks turning left out of the quarry, it was determined that the presence of trucks in the acceleration lane before that lane reaches Black Bart Drive at the same time that drivers turning left into Black Bart Drive would be a rare occurrence. It is calculated that 97% of drivers turning left into Black Bart Drive (during peak hours in July and October) would not experience any "conflicts" (i.e., trucks in the median lane between the project access and Black Bart Drive

Overall Project Access Intersection Operation

Overall, even with the increased truck volumes generated by the project, the recommended safety improvements being proposed to assist both left- and right-turn movements from Highway 101 into the project site as well as turns from the project site onto Highway 101 would improve the overall safety of the project access intersection. The overall impact to the intersection would be reduced to a ***less-than-significant*** level when compared to Base Case conditions.

However, if travel volumes on Highway 101 increase as Caltrans projects, there will be an increasing risk of vehicular conflicts between turning trucks and through traffic, and there will come a point where additional operational improvements and/or intersection improvements may be warranted to maintain adequate traffic safety. Mitigation 4.4-B.2 provides the County and Caltrans with oversight of ongoing monitoring of intersection operations and, if warranted, additional operational improvements and/or highway improvements.

Mitigation 4.4-B.3 provides the County with a method of monitoring aggregate production to ensure that the quarry does not result in additional or more severe traffic or other impacts than were assessed in this EIR.

Nighttime Safety Impacts

Impact 4.4-C Nighttime use of the project access would increase the safety hazard in the area.

During most years, nighttime operations would be limited to a 1-5 nights a year when an emergency need occurs. This use would occur so infrequently that trips generated on those few nights would not have a significant effect on roadway operations. However, the applicant has reserved the right to operate up to 100 nights per year in order to serve large roadway projects like construction of the Willits Bypass. These trips would not have

a significant impact on the level of service because traffic volumes on Highway 101 are much lower at night than the peak periods assessed in Impact 4.4-A. The safety impact assessed in Impact 4.4-B would also be less due to the decreased amount of traffic. However, because the area near the project access is unlit, travelers on Highway 101 would not be expecting trucks turning in and out of the project site during nighttime hours (even though there will be lighted warning signs). There would be an increased risk of traffic accidents. This would be a ***potentially significant*** safety impact.

Mitigation Measures

4.4-C.1 During nighttime operations that will occur more than 5 days a year, the applicant will provide lighting that illuminates the access intersection. The lighting can be permanent lighting or temporary lighting such as Caltrans uses in construction zones.

Impact Significance After Mitigation

Lighting the access intersection (required only when the project operates at night) will alert drivers that the access is there and potentially in use. The lighting will allow drivers to see trucks waiting to pull out onto Highway 101. This lighting plus previously required mitigations will reduce the impact to a ***less-than-significant*** level.

Bad Weather Safety Impacts

Impact 4.4-D Use of the project access during times with limited visibility would increase the safety hazard in the area.

The Ridgewood Grade experiences frequent episodes of fog, which reduces visibility. Reduced visibility reduces the time that drivers have to stop for a truck turning into or out of the project access. This exacerbates the ***potentially significant safety impact.*** Visibility is also reduced during winter storms, however, the project would not be expected to generate much if any traffic during those periods

Mitigation Measures

4.4-D.1 The southfacing side of the "truck warning sign" located north of Black Bart Drive shall be painted or treated with a reflective surface or have a light installed that can be seen from the project access driveway. During periods of reduced visibility, the quarry operator will monitor the visibility of this sign. When it is not visible from the project access driveway, then trucks will not be permitted to turn left out of the project. Drivers will need to turn right and proceed to the Highway 101/Highway 20 interchange where they can turn and proceed north. Once the Willits Bypass is constructed, northbound drivers wanting to turn left into the project who cannot see the reflective surface of the warning sign will be required to proceed north to the first Bypass interchange where they can turn and access the project from the north. The applicant shall prepare a driver's training manual for trucks that haul aggregate or asphalt. It shall notify drivers of the requirements described above.

4.4-D.2 The monitoring done by the County-approved monitor recommended in Mitigation Measure 4.4-B.2 shall include monitoring of safety and compliance with Mitigation 4.4-D.1 during periods of limited visibility.

Impact Significance After Mitigation

The recommended sight distance (about 925 feet from the sign to the project access) is sufficient for a speed over 75 miles per hour (on a 3% downhill grade). This sight distance exceeds what is required for observed speeds, and would be expected to be substantially greater than what is required for speeds during periods of limited visibility. The recommended mitigation eliminates the hazard of trucks turning left out of the project during periods of limited visibility. There remains some hazard of drivers turning left into the project until the Willits Bypass is constructed. However, the overall reduction in the existing hazard where there are currently no deceleration or acceleration lanes and no restrictions on left turns reduces the impact to a ***less-than-significant*** level.

Commenters on the original Draft EIR also expressed concern about fuel trucks turning left into the project. See the discussion under Impact 4.9-B regarding this safety concern.

C. Cumulative Impacts

Impacts in the Year 2014

Impact 4.4-E The project would increase 2014 traffic volumes at the intersections of Highway 101 with Black Bart Drive and the quarry access.

As shown on Tables 4.4-7 and 4.4-8, project traffic plus projected 2014 increases in traffic on Highway 101 and Black Bart Drive would further reduce the Level of Service for some hours at the two study intersections. The intersections would continue to operate at acceptable Levels of Services except for some hours during the peak month of July at the project access intersection under the scenario that includes construction of the Willits Bypass. The LOS would decline to LOS E for July for that scenario. This is a ***potentially significant impact.***

The Level of Service can be restored to an acceptable level by implementing the mitigations already recommended for the project (see Mitigation Measure 4.4-B.1). However, if volumes increase as Caltrans projects for Highway 101, truck drivers may experience fewer and fewer acceptable gaps for turn movements from the quarry to Highway 101. In addition, the increased number of trucks turning left out of the quarry access may cause conflicts with drivers attempting to turn left into Black Bart Drive. As described in previous impacts, these potential conflicts would be exacerbated by bad weather or limited visibility. Mitigation Measure 4.4-B.2 addresses these potential operational and safety concerns.

Mitigation Measures

Mitigation Measures 4.4-B.1, 4.4-B.2, 4.4-C.1 and 4.4-D.1 are required for both 2014 scenarios.

Impact Significance After Mitigation

As shown on Tables 4.4-7 and 4.4-8 the proposed improvements would result in acceptable levels of service. These improvements plus the other mitigation recommended for Impacts 4.4-C and 4.4-D will reduce the project's contribution to cumulative roadway conditions to a ***less-than-cumulatively considerable*** level.

Impacts for the Year 2030

Impact 4.4-F The project would increase 2030 traffic volumes at the intersections of Highway 101 with Black Bart Drive and the quarry access.

As shown on Tables 4.4-7 and 4.4-8, project traffic plus projected 2030 increases in traffic on Highway 101 and Black Bart Drive would further reduce the Level of Service at the two study intersections. The intersections would continue to operate at acceptable Levels of Services except for the peak months of July and October. This is a ***potentially significant impact.***

The Level of Service can be restored to an acceptable level by implementing the mitigations already recommended for the project (see Mitigation Measure 4.4-B.1). However, if volumes increase as Caltrans projects for Highway 101, truck drivers may experience fewer and fewer acceptable gaps for turn movements from the quarry to Highway 101. In addition, the increased number of trucks turning left out of the quarry access may cause conflicts with drivers attempting to turn left into Black Bart Drive. As described in previous impacts, these potential conflicts would be exacerbated by bad weather or limited visibility. Mitigation Measure 4.4-B.2 addresses these potential operational and safety concerns.

Mitigation Measures

Mitigation Measures 4.4-B.1, 4.4-B.2, 4.4-C.1 and 4.4-D.1 are required for both 2030 scenarios.

Impact Significance After Mitigation

As shown on Tables 4.4-7 and 4.4-8 the proposed improvements would result in acceptable levels of service. These improvements plus the other mitigation recommended for Impacts 4.4-C and 4.4-D will reduce the project's contribution to cumulative roadway conditions to a ***less-than-cumulatively considerable*** level.

4.5 NOISE

The analysis of noise impacts was prepared with the technical assistance of Illingworth & Rodkin, Inc. (I&R), acoustic and air quality consultants. The applicant had a noise analysis prepared for the project, and this report was used, when appropriate and its findings confirmed, in preparing this section.

A. Setting

This report presents the results of the environmental noise assessment performed for the Harris Quarry Expansion project in Mendocino County, California. The project would allow the extraction of rock from expansion of an existing hillside quarry and the construction of an asphalt processing facility. The setting section presents the fundamentals of environmental noise, provides a discussion of policies and standards applicable to the project, and presents a discussion of the existing noise environment at sensitive receivers in the site vicinity. The impacts and mitigation measures section provides a discussion of potential noise impacts including generation of sensitive receivers to noise levels in excess of standards established in the local general plan and noise ordinance, generation of excessive groundborne vibration, potential permanent increases in noise resulting from the operation of the project, and the potential for temporary noise increases as a result of project construction activities. Mitigation measures are then presented to reduce significant noise impacts to a less-than-significant level.

1. Fundamentals of Environmental Noise

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. Decibels and other technical terms are defined in Table 4.5-1.

Most of the sounds which we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflects the facts that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency mid-range. This is called “A” weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Typical A-weighted levels measured in the environment and in industry are shown in Table 4.5-2 for different types of noise.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which create a relatively steady background noise in which no particular source is identifiable.

Table 4.5-1
Definitions of Acoustical Terms Used in This Report

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. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	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.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
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.
Day/Night Noise Level, L_{dn} or DNL	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.
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.
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.

Source: Illingworth & Rodkin, Inc.

Table 4.5-2
Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	120 dBA	
Jet fly-over at 300 meters		Rock concert
	110 dBA	
Pile driver at 20 meters	100 dBA	
		Night club with live music
	90 dBA	
Large truck pass by at 15 meters		
	80 dBA	Noisy restaurant
Freeway at 30 meters		Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70 dBA	Vacuum cleaner at 3 meters
Commercial/Urban area daytime		Normal speech at 1 meter
Suburban expressway at 90 meters	60 dBA	
Suburban daytime		Active office environment
	50 dBA	
Urban area nighttime		Quiet office environment
	40 dBA	
Suburban nighttime		
Quiet rural areas	30 dBA	Library
		Quiet bedroom at night
Wilderness area	20 dBA	
Most quiet remote areas	10 dBA	Quiet recording studio
Threshold of human hearing	0 dBA	Threshold of human hearing

Source: Illingworth & Rodkin, Inc.

To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{01}, L_{10}, L_{50}, and L_{90}, are commonly used. They are the A-weighted noise levels equaled or exceeded during 1%, 10%, 50%, and 90% of a stated time period. A single number descriptor called the L_{eq} is also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, L_{dn} (day/night average sound level), was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

2. Regulatory Background

The State of California and Mendocino County establish guidelines, regulations, and policies designed to limit noise exposure at noise sensitive land uses.

a. Mendocino County Noise Element of the General Plan

The Noise Element of the Mendocino County General Plan (adopted August, 2009) sets forth goals and policies related to noise and land use compatibility. Applicable policies to this project are as follows:

Policy DE-98: The County will protect residential areas and other noise-sensitive uses from excessive noise by doing the following:

1) Requiring that new land uses, new roadways, and other new noise sources do not create unacceptable noise levels on adjacent parcels.
2) Allowing homes or noise-sensitive uses to be developed only in places where existing and projected noise levels will meet the exterior noise guidelines and standards shown in Policies DE-100 and DE-101.
3) Requiring that County decisions which would cause or allow an increase in noise created by stationary or mobile sources (such as development of noise-generating land uses or the construction of new or wider roadways) be informed by a noise analysis and accompanied by noise reduction measures to keep noise at acceptable levels.

Policy DE-99: To implement Policy DE-98, the following shall apply:

1) No new use regulated by the County shall be permitted to generate noise that would cause the ambient noise on any adjacent parcel to exceed the "completely compatible" 24-hour guidelines shown in Policy DE-101 or the 30-minute noise standards in Policy DE-100.

2) The County shall ensure that noise mitigation to achieve a "completely compatible" 24-hour exterior noise level and conformance with the 30-minute exterior noise standard is provided in conjunction with any decision[99] it makes that would cause a violation of item 1) above.

Action Item DE-99.1: Apply the State Noise Insulation Standards, zoning and building controls, buffers, sound barriers, traffic controls, and other effective measures to reduce exposure to unsafe and undesired noise sources.

Action Item DE-99.2: Require acoustical studies for:

- Significant new noise generators,

If information on the noise environment at a project site is not available, a measurement of the noise environment by a qualified acoustical engineer may be needed to make a determination whether a proposed project complies with the guidelines and standards in Policy DE-100 or DE-101.

Action Item DE-99.3: The County will seek to obtain noise mitigation from other agencies (including the State of California) required to address the noise impacts of decisions made by those agencies (including, but not limited to, roadway widening and railroad operations).

Policy DE-100: The following are the County's standards for maximum exterior noise levels for residential land uses.

General Plan Table 3-J Exterior Noise Level Standards (Levels not to be exceeded more than 30 minutes in any hour)

Land Use Type	Time Period	Maximum Noise Level (dBA)
Land Use Type	Time Period	Maximum Noise Level (dBA)
Single-Family Homes and Duplexes	10 p.m. to 7 a.m.	50
	7 a.m. to 10 p.m.	60
Multiple Residential 3 or More Units Per Building (Triplex +)	10 p.m. to 7 a.m.	55
	7 a.m. to 10 p.m.	60

1) Where existing ambient noise levels exceed these standards, the ambient noise level shall be the highest allowable noise level as measured in dBA Leq (30 minutes).
2) The noise levels specified above shall be lowered by 5 dB for simple tonal noises (such as humming sounds), noises consisting primarily of speech or music, or for recurring impulsive noises (such as pile drivers, punch presses, and similar machinery).
3) The County may impose exterior noise standards which are less restrictive than those specified above, provided that:

[99] Examples of decisions include: Roadway construction projects, public park construction, General Plan amendments, changes of zone, conditional use permits, and site plan review approval.

- The noise impact on the residential or other noise-sensitive use is addressed in an environmental analysis,
- A finding is made by the approving body stating the reasons for accepting a higher exterior noise standard, and
- Interior noise standards will comply with those identified in Policy DE-103.

Policy DE-101: The following are noise compatibility guidelines for use in determining the general compatibility of planned land uses:

General Plan Table 3-K Noise Compatibility Guidelines (Expressed as a 24-hour day-night average or Ldn)

Land Use	Completely Compatible	Tentatively Compatible	Normally Incompatible	Completely Incompatible
Residential	Less than 55 dBA	55-60 dBA	60-75 dBA	Greater than 75 dBA
Commercial	Less than 65 dBA	65-75 dBA	75-80 dBA	Greater than 80 dBA
Industrial	Less than 70 dBA	70-80 dBA	80-85 dBA	Greater than 85 dBA

See Policy DE-5 for the definitions of these levels of compatibility.

1) These guidelines apply to land designated by this General Plan for these uses. Residential, retail, or public parks which have been developed on land designated for other uses shall be subject to the exterior noise guidelines for the land on which they are located.
2) Non-residential uses located on residentially designated land shall be subject to the exterior noise guidelines for residential lands.
3) All uses on Commercial lands, including non-commercial uses, shall be subject to the standards for Commercial land.
4) Land use designations not listed above do not have exterior noise compatibility standards. Land use designations with no exterior noise compatibility standard include office and industrial.

Policy DE-102: The following definitions shall be used in combination with the standards in the Noise Compatibility Guidelines shown above.

- "Transportation Noise" consists of noise generated by motor vehicles, trains, and airports.
- "Completely Compatible" means that the specified land use is satisfactory and both the indoor and outdoor environments are pleasant.
- "Tentatively Compatible" means that noise exposure may be of concern, but common building construction practices will make the indoor living environment acceptable, even for sleeping quarters, and the outdoor environment will be reasonably pleasant.
- "Normally Incompatible" means that noise exposure warrants special attention, and new construction or development should generally be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise

insulation features are included in the design. Careful site planning or exterior barriers may be needed to make the outdoor environment tolerable.

- "Completely Incompatible" means that the noise exposure is so severe that new construction or development should generally not be undertaken.

Policy DE-103: The following are the County's standards for acceptable indoor intermittent noise levels for various types of land uses. These standards should receive special attention when projects are considered in "Tentatively Compatible" or "Normally Incompatible" areas, and new uses shall incorporate design features to ensure that these standards are met.

Table 3-L
Maximum Acceptable Interior Noise Levels Created by Exterior Noise Levels

Land Use Type	Acceptable Noise Level (dBA Ldn or CNEL)
Residential Living and Sleeping Areas, Daytime	45 dBA
Private School Classrooms	55 dBA
Commercial, Educational, Office, Light and Heavy Industrial, Warehousing	Conform with applicable State and Federal workplace safety standards

Policy DE-104: New or expanded uses shall comply with adopted noise standards to ensure minimal impact on established noise-sensitive uses.

Policy DE-105: A 5 db increase in CNEL or L_{dn} noise levels shall be normally considered to be a significant increase in noise.

b. Mendocino County Surface Mining and Reclamation Zoning Ordinance

Chapter 22.16, Section 22.16.070 establishes exterior noise limit standards for surface mining activities:

In addition to meeting the minimum acceptable surface mining and reclamation practices in the Act and policy guidelines, each surface mining operation requiring a permit shall be conducted and designed to meet the following operational standards. Conditions may be imposed on mining permits to ensure compliance with minimum acceptable practices and standards. The Ordinance states:

"(J) Noise levels created by the operation as measured at the nearest residence other than that of the mine owner or operator shall not exceed the following:

(1) Sixty-five (65) dB(A) for a cumulative period more than thirty (30) minutes in any hour;
(2) Seventy (70) dB(A) for a cumulative period more than twelve (12) minutes in any hour;

(3) Seventy-five (75) dB(A) for a cumulative period more than three (3) minutes in any hour;
(4) Eighty (80) dB(A) for a cumulative period more than one (1) minute in any hour;
(5) Eighty-five (85) dB(A) at any moment.
(6) More stringent noise standards may be required as permit conditions when particular local circumstances warrant additional protection of potentially affected residences."

Any noise control measures prescribed by the lead agency as a condition of a permit shall in no manner be interpreted as to preclude the application to the surface mining site of future noise control measures adopted by the County subsequent to the granting of the permit.

c. Mendocino County Inland Zoning Code

Title 20, Division 1 presents exterior noise limit standards as summarized in Table 4.5-3, below:

3. Existing Noise Environment

Harris Quarry is located west of Highway 101 and south of Black Bart Drive. The site of the proposed asphalt plant is located immediately south of Black Bart Drive (County Road No. 370) about 2,000 feet west of Highway 101. Surrounding land uses to the east include transportation corridors (i.e., Highway 101 and the Northwest Pacific Railroad) and open space. To the west of the quarry is undeveloped land owned by the applicant and rural residential development. The nearest residence to the west is about 1.4 miles west of the quarry. The nearest residence to the asphalt processing facility site is about one mile to the west. To the south is undeveloped open space belonging to the Church of the Golden Rule. The Church's compound (off Ridgewood Road) is located about one mile south of the quarry. A mobile home park (Golden Rule Mobile Village) is located about 1.75 miles south of the quarry. Commercial development including a motel and a restaurant are located to the north of the quarry site and northeast of the asphalt processing facility site. This development is as near as 1,000 feet of the processing site. North of the asphalt processing facility site (and west of the highway commercial area) is open space land owned by the applicant. Further north and northwest are rural residential properties; the property boundary of the nearest rural residential property is about 3,000 feet north of the asphalt processing facility site, with the nearest home located approximately one mile away.

A noise monitoring survey was made by Illingworth & Rodkin, Inc. to quantify ambient noise levels at receivers near the quarry and to document noise levels generated by activities and equipment at the existing quarry. Noise measurements were made in October 2006. A combination of unattended long-term noise measurements and attended short-term noise measurements were made to document existing noise levels representative of the nearest residential receivers (Figure 4.5-1).

Table 4.5-3
Exterior Noise Limit Standards

Receiving Land Use Category[3],[4]	Time Period	Noise Level Standards (dBA)[1],[2]	
		Rural/Suburban	Urban/Highways[5]
One and Two Family Residential	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	40 50	50 60
Multifamily Public Spaces	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	45 50	55 60
Limited Commercial Some Multifamily	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	55 60	
Commercial	10:00 p.m. - 7:00 a.m. 7:00 a.m. - 10:00 p.m.	60 65	
Light Industrial Heavy Industrial	Any time Any time	70 75	
Adjustments to Noise Level Standard			
Duration			
L50	30 minutes per hour	Standard	
L25	15 minutes per hour	Standard + 5 dB	
L0	Maximum permissible level	Standard + 20 dB	
Character	Tone, whine, screech, hum, or impulsive, hammering, riveting, or music or speech	**Standard + 5 dB**	
Ambient Level[1]	Existing ambient L50, L25 Existing ambient L0	Standard + 5dB Existing maximum	

Interpretive Footnotes:
(1) When an acoustical study demonstrates that ambient levels exceed the noise standard, then the ambient levels become the standard.
(2) Higher noise levels may be permitted for temporary, short-term or intermittent activities when no sensitive or residential uses will be affected.
(3) County staff shall recommend which receiving land use category applies to a particular project, based on the mix of uses and community noise levels. Industrial noise limits intended to be applied at the boundary of industrial zones, rather than within industrial areas.
(4) The "rural/suburban" standard should be applied adjacent to noise sensitive uses such as hospitals or convalescence homes.
(5) "Highways" apply to roads and highways where average daily traffic (ADT) exceeds 10,000.
(Ord. No. 4017 (part), adopted 1998)

The first long-term noise measurement was made along Blackhawk Drive at a site with an uninterrupted view of the proposed asphalt plant. Noise measurement location LT-1 was selected to best represent noise conditions at the proposed residential receivers to

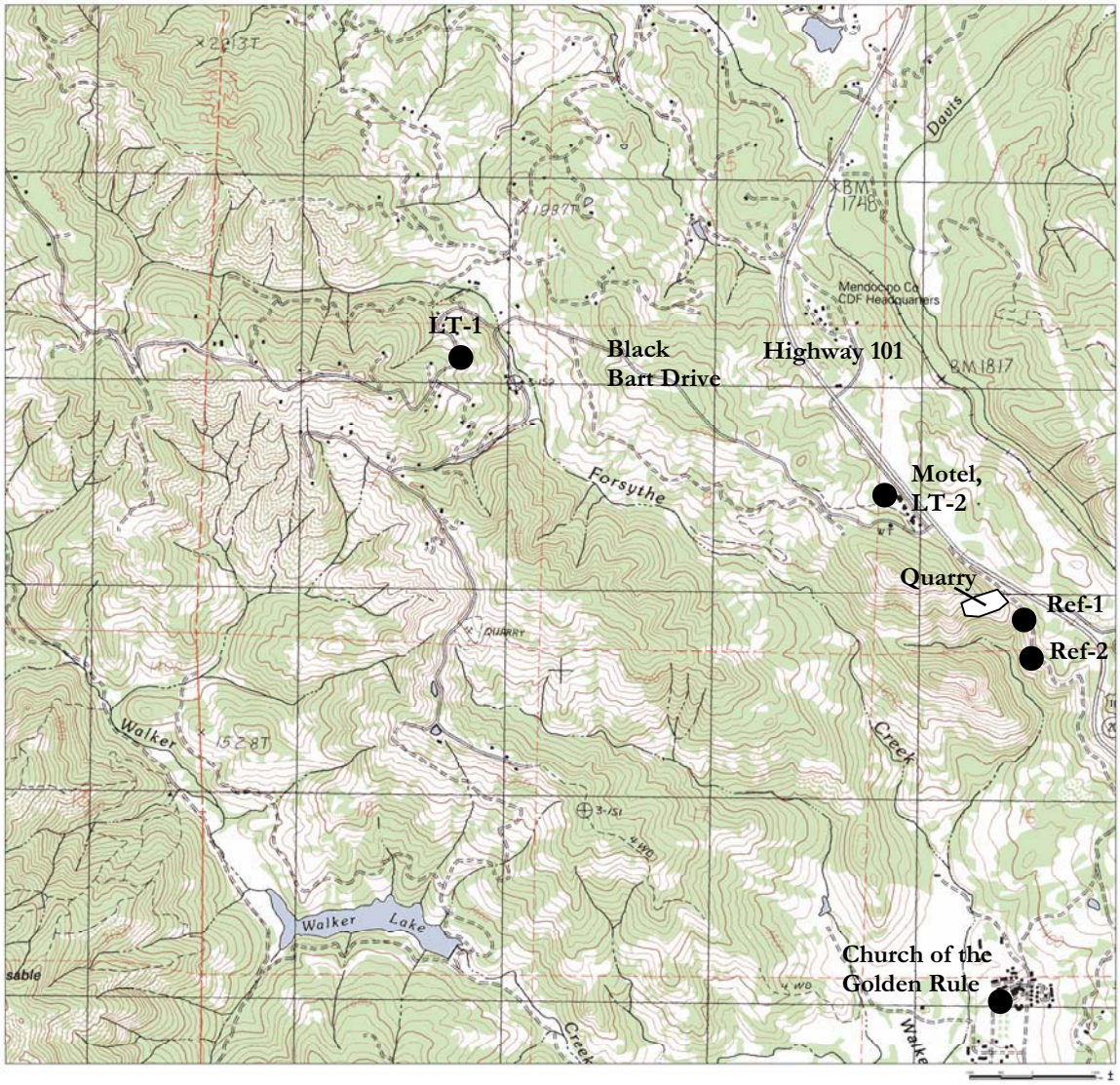


Figure 4.5-1: Noise Measurement Locations

from 30 to 40 dBA during the day and night. Data collected at Site LT-1 are depicted in Figure 4.5-2.

The second long-term noise measurement was made at the motel north of Harris Quarry. Noise measurement location LT-2 was selected to represent ambient noise levels at commercial/residential properties near Highway 101. The day-night average noise level at this location was 58 dBA Ldn. The median noise level (L50) generally ranged from 50 to 55 dBA during the day and from 46 to 50 dBA during the night. Data collected at Site LT-2 are depicted in Figure 4.5-3.

Two short-term noise measurements were made south of the existing quarry at residential receivers located on the Church of the Golden Rule property to represent typical daytime background noise levels (L90). The first short-term site was at the north end of the developed property near "Seabiscuit's Barn". The second short-term measurement site was at the north end of the mobile home park. Measured background noise levels were low and ranged from about 31-34 dBA between 12:00 p.m. and 12:20 p.m. The noise environments at the selected measurement positions were predominantly the result of distant traffic noise and the sounds of nature. Quarry noises were difficult to distinguish from Highway 101 traffic noise.

A series of noise measurements were also made to document noise levels generated by activities and equipment at the existing quarry. The data are summarized in Table 4.5-4. Major sources of noise at the quarry include the processing equipment and mobile equipment. Processing equipment includes crushers, screens, conveyors, and a generator. On-site mobile equipment includes two loaders, an excavator, bulldozer and bobcat. Trucks transport the aggregate from the quarry. Noise measurements were made at various locations to characterize the noise of the different sources.

Table 4.5-4
Noise Levels at the Existing Quarry

	Noise Level (dBA)	
Source and Distance	**Average**	**L_{max}**
Primary and secondary crushers at 100 feet	81	82
Loader and truck at 150 feet loading small aggregate	73	82
Excavator at Quarry Pit and truck at 130 feet	71	73
Loader driving by at 15 feet	86	89
Loader and truck at 65 feet	83	93
Overall processing plant noise level at		
375 feet to south	65	67
940 feet to south*	53	58

* The measurement included some excess attenuation from an existing berm around the floor of the processing area.

B. Potential Impacts and Mitigation Measures

1. Criteria Used for Determining Impact Significance

Appendix G of the State CEQA Guidelines provides that a project would have a significant noise impact if it would:

4.5a Expose people to or generate noise levels in excess of standards established in the Mendocino County General Plan and Zoning Ordinance.

4.5b Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. A substantial permanent noise increase would occur if the project would increase existing noise levels at sensitive land uses by 5 dBA Ldn or greater per Policy DE-105 of the General Plan.

4.5c Result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. A substantial temporary noise level increase would occur where noise from construction activities exceeds 60 dBA L_{eq} and the ambient noise environment by at least 5 dBA L_{eq} at noise-sensitive uses in the project vicinity for a period of more than one year.

4.5d For projects within an area covered by an airport land use plan or within two miles of a public airport or public use airport when such an airport land use plan has not been adopted, or within the vicinity of a private airstrip, expose people residing or working in the project site to excessive aircraft noise levels.

4.5e Expose people to or generate excessive groundborne vibration or groundborne noise levels.

2. Project Impacts

The project is not within an area covered by an airport land use plan or a public airport (Criterion 4.5d), so there is no impact per this Criterion. The use of the CAL FIRE heliport is so infrequent that it would not adversely affect workers on the site and would not expose people working at the site to excessive aircraft noise.

Noise Impacts on Residential Land Uses

Impact 4.5-A The project would generate noise that might affect residents living in the area.

Noise impacts that could potentially result from the operation of the proposed project were initially assessed in a report prepared for the applicant by Sound Solutions.[100] An

[100] Noise Impacts and Mitigation in Connection with the Proposal to Add Operations to the Harris Quarry, Mendocino County, California, prepared by T.A. Barneby, Ph.D., Sound Solutions Acoustical Consulting Services, for Jason McConnell, Northern Aggregates, September 7, 2005.

Figure 4.5-2

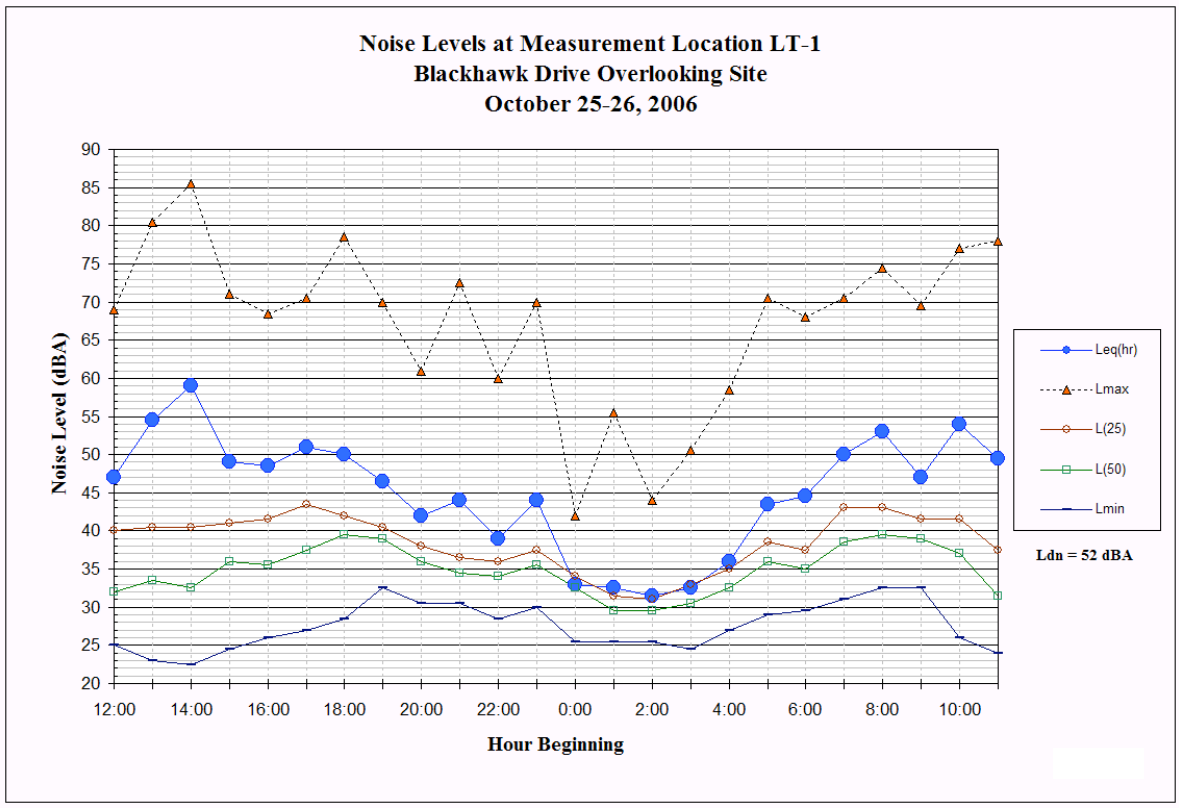
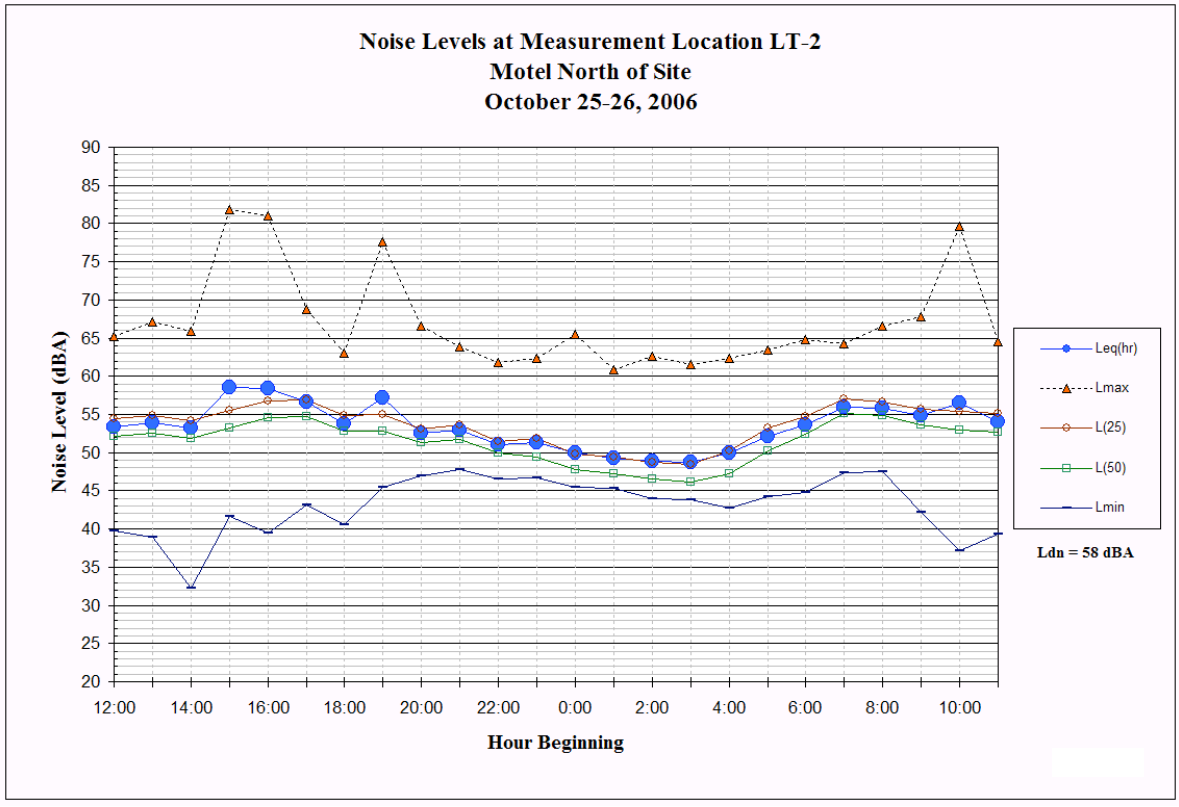


Figure 4.5-3



independent assessment of the noise impacts was prepared for this EIR by Illingworth & Rodkin, Inc. (I&R). The following discussion summarizes the noise assessment for this EIR. Where appropriate, comparisons are made between the findings in the noise studies.

The project would allow extraction of rock from expansion of the existing hillside quarry and construction and operation of an asphalt processing plant. The current yearly extraction limit is 75,000 cubic yards from the site. The project includes an annual permitted volume of 200,000 cubic yards per year. Quarry expansion would occur in a single phase. The mining would expand to the north and west while maintaining the current elevation of the quarry floor (elevation 1,850 feet). Mining includes initial blasting of the rock. The quarry face is then benched with a series of vertical and horizontal planes as the material is removed.

Equipment used for quarrying would not increase. However, as existing equipment wears out, it would be replaced by newer equipment. The only new addition to the quarry plant equipment would be a wash plant.

The quarry currently operates from 7:00 AM to 4:00 PM, the concrete plant in Willits operates from 5:00 AM to 4:00 PM. The quarry can open at any time day or night, any day of the week, when there are emergency situations, typically per the request of Caltrans or the Mendocino County Department of Transportation. Historically, this has happened 0 to 5 times per year. Proposed operations for the project moving forward are:

- Quarry operations, 6:00 AM to 5:00 PM
- Equipment running, 7:00 AM to 5:00 PM
- Asphalt operations, 6:00 AM to 5:00 PM
- Equipment running, 6:00 AM to 4:00 PM

The operation of the new asphalt manufacturing facility would occur a maximum of 10 hours in any 24-hour period. Currently, the aggregate crushing operation does not operate five days per week, every week of the summer. A more continuous operation would allow for the additional request in volume without putting excess demand or additional equipment in operation. The quarry and asphalt operations would normally only operate from Monday to Friday, five days a week. It is not expected that nighttime operations would occur more frequently than they have historically to respond to emergencies. A large highway paving project could necessitate extensive night work anticipated to be a maximum of about 100 nights.

A computer model was used to calculate noise levels for the proposed project. The model, SoundPlan Version V7.0, is a three-dimensional ray-tracing program, which takes into account the sources of noise, the frequency spectra, and the topography of the area. For the quarry area, existing noise measurement data presented in the Setting Section was input into the model. The data was then propagated out to the positions designated Reference 1 and Reference 2 and compared to measured levels. The Sound Solution study established a source noise level for the asphalt plant including

This report is on file and available for public review at the offices of the Mendocino County Department of Planning and Building Services.

trucks at 72 dBA Leq. Based on other recent data for similar asphalt plants, I&R utilized a source noise level of 73 dBA Leq.

Figure 4.5-4 shows the output from the Sound Plan noise model for the existing quarrying and aggregate crushing and screening operations. At Location Ref-1, the modeled noise level was 65 dBA matching the measured noise level shown in Table 4.5-4. At Ref-2, the modeled noise level was 53 dBA matching the measured noise level shown in Table 4.5-4. The model is, therefore, calibrated and considered accurate for noise projections.

Projected noise contours from the future quarry operations are shown on Figure 4.5-5. During Phase 1, the quarry floor would be located at an elevation of 1,850 feet. In the future, the noise sources at the proposed asphalt processing area have been included. The noise contours show the hourly average noise level represented by the L_{eq} noise descriptor. The L_{eq} is always equal to or higher than the median (L_{50}) noise level. For comparison to County noise ordinance standards then, the L_{eq} is a conservative descriptor. It is typically 0 to 3 dBA higher than the L_{50}. The L_{eq} is the building block for the L_{dn}, the day/night average noise level which is used to test whether or not there would be a substantial increase in overall noise levels as will be discussed later.

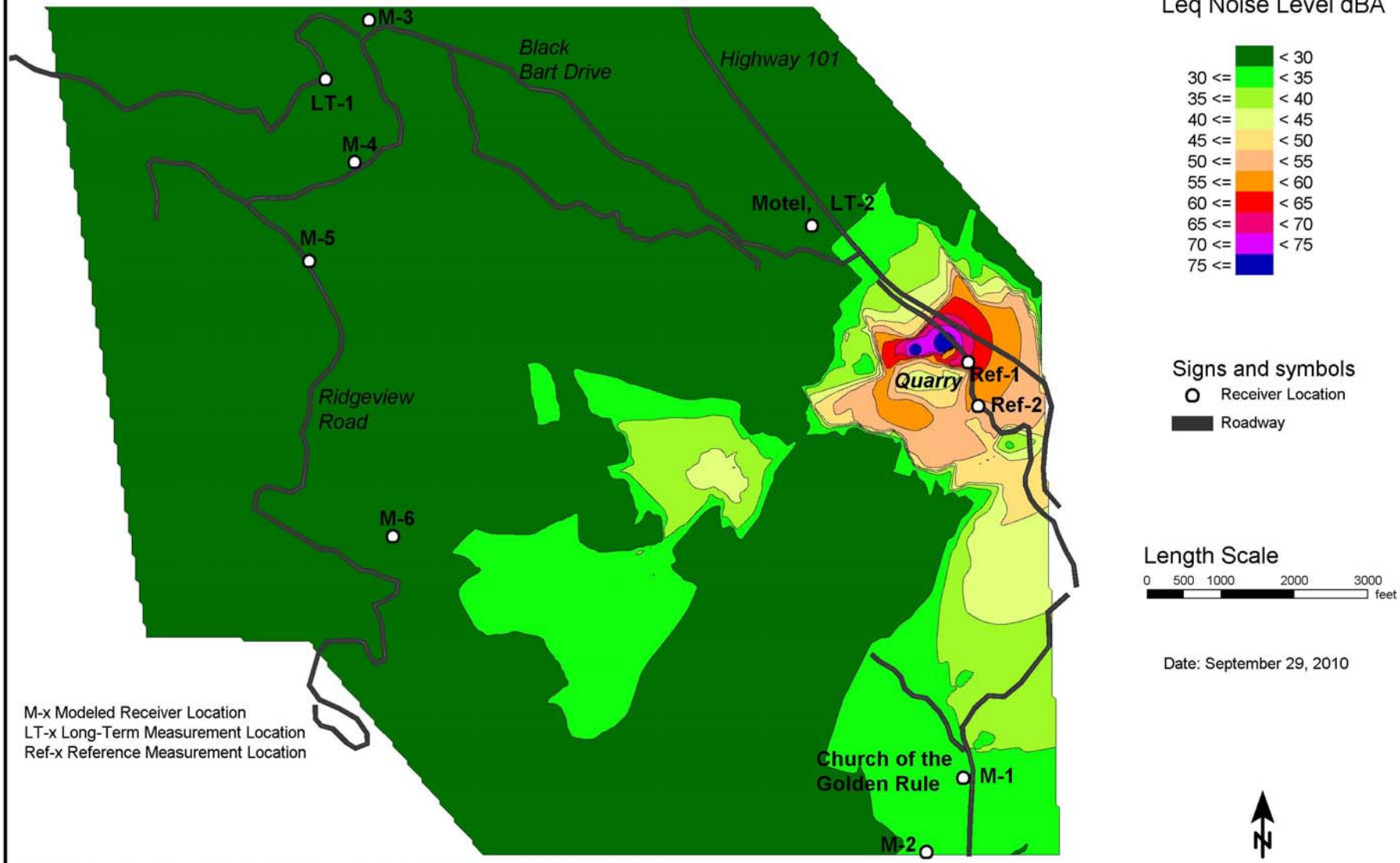
The results of the modeling are compared to the allowable noise limits and summarized in Table 4.5-5. The County noise limits also regulate the noise level exceeded 25 percent of the time and the Lmax level during any hour. Data presented in the Sound Solutions report, I&R noise measurement data for the quarry, and data from other plants, demonstrate that the L_{25} noise level is typically 1 to 3 dBA higher than the L_{50} noise level, and the L_{max} noise level is typically 10 dBA (or less) greater than the median noise level. For these reasons, the L_{50} noise descriptor is the most restrictive and conservative assessor of noise impacts. Projected noise levels would be below the most restrictive County noise limits, the nighttime noise limits for the median (L_{50}) noise descriptor.

Truck traffic on the access road between the new project entrance off Highway 101 and the asphalt plant area was separately modeled to determine its effect on the motel. It was determined through this modeling that the intermittent truck traffic would have no effect on modeled noise levels at any of the other sensitive receiver locations. Truck traffic noise levels generated by trips along the proposed haul road were calculated with the Caltrans LEQV2 traffic noise model based on FHWA's Stamina/Optima traffic noise model.

Noise levels at the nearest sensitive receiver, the motel located approximately 300 feet away from the haul road at its closest point, were calculated to be 44 dBA $L_{eq\text{-}hour}$ assuming 7 heavy-duty trucks making a round trip between the quarry entrance and the asphalt batch plant.[101] The future noise level at the motel from all other on-site activities, particularly noise from the new asphalt plant, are projected to be 48 dBA L_{eq}. Using decibel addition, the incremental addition of the truck traffic noise to the other sources would cause a 2 dBA further increase in noise from the noise levels at the motel, so the hourly average noise level during the daytime or the nighttime at the motel resulting from

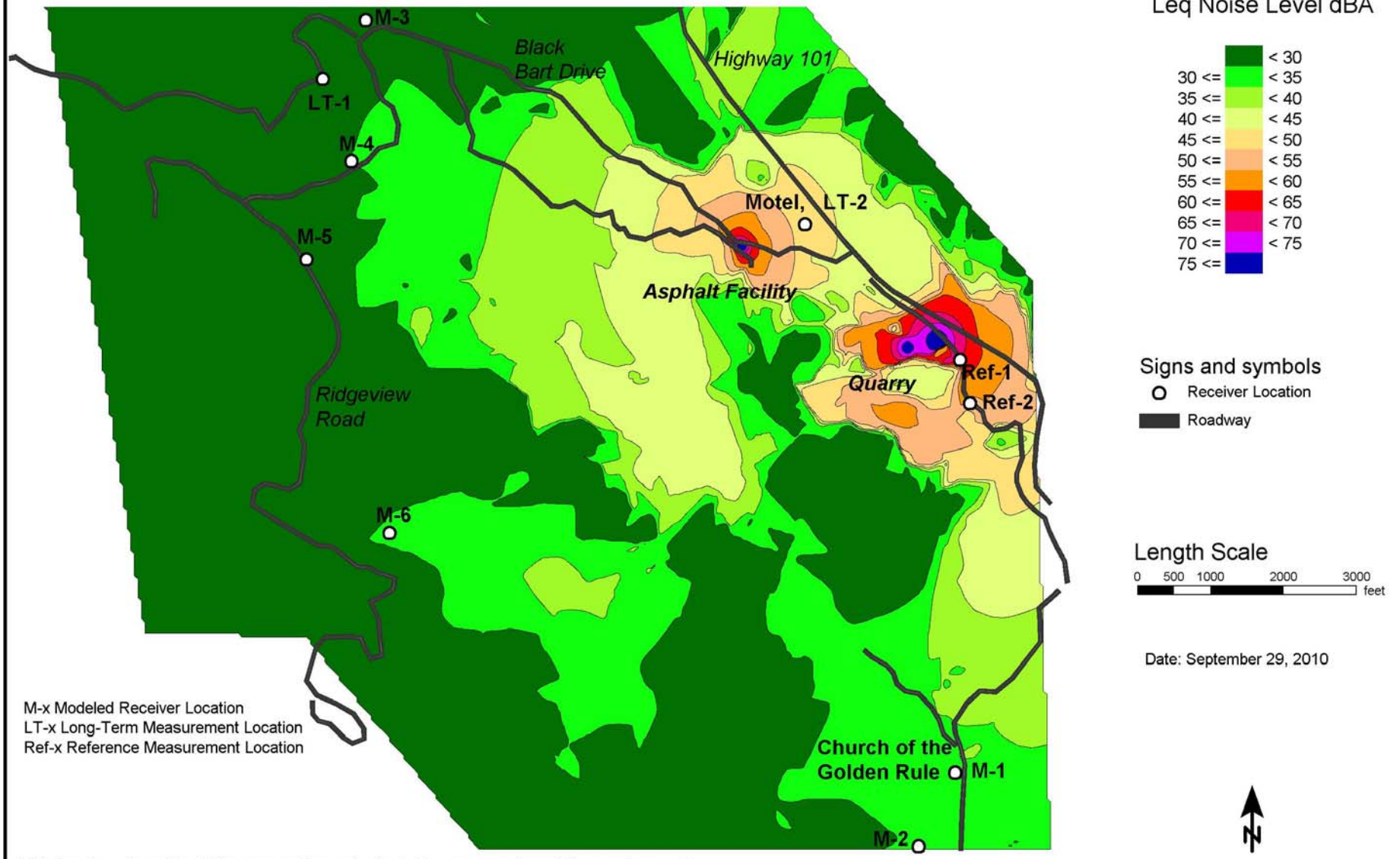
[101] W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010.

Figure 4.5-4: Existing Quarry Noise Contours



* Noise levels reflect the operation of all stationary and mobile equipment.
** Leq noise levels are indicated in the graphic. L50 noise levels would be equal to or lower than Leq noise levels.

Figure 4.5-5: Future Quarry Noise Contours



* Noise levels reflect the operation of all stationary and mobile equipment.
** Leq noise levels are indicated in the graphic. L50 noise levels would be equal to or lower than Leq noise levels.

Table 4.5-5
Future Project Noise

		A-Weighted Noise Level (L_{eq}/L_{50})			
Receiver Location*	**Existing Night Background Noise (dBA)**	**Existing Quarry-Generated Noise (Day Only)**	**Future Project-Generated Noise (Night/Day**)**	**Impact Level (County Limit - Night/Day)**	**Impact Yes/No**
M1 Church of the Golden Rule	25-30	34	25/34	40/50	No
M2 Oak Dr.	25-30	31	24/32	40/50	No
LT-1 Blackhawk Dr.	25-30	<20	29/29	40/50	No
LT-2 Motel	45-50	28	50/50***	55/60	No
M3 Black Bart Dr.	25-30	<20	27/27	40/50	No
M4 Black Bart Dr.	25-30	<20	30/30	40/50	No
M5 Ridgewood Rd.	25-30	<20	<20/<20	40/50	No
M6 Baywood Way	25-30	27	25/31	40/50	No
Ref. 1 ****	N/A	65	<20/65	N/A	N/A
Ref. 2 ****	N/A	53	<20/53	N/A	N/A

Notes:
* See Figure 4.5-1.
** Night assumes only asphalt plant operating.
*** Includes truck traffic on the haul road.
**** Reference locations are shown for comparison purposes only. Impacts are not assessed at reference locations at the quarry.

all operations at the proposed project would be no more than 50 dBA L_{eq}/L_{50}. Project noise levels would be below the impact level and cause a less-than-significant impact.

The other question is whether or not noise from the proposed project would cause a substantial increase in noise levels at sensitive receivers in the project vicinity. A substantial increase would result if noise from the project caused the noise level to increase by 5 dBA L_{dn} or more. The existing L_{dn} at residences located to the northwest represented by receiver LT-1 was measured and found to be 52 dBA L_{dn}. The existing L_{dn} is expected to range from about 50-55 dBA L_{dn}, depending upon the proximity of sensitive receivers to local roadways and the views to distant Highway 101.

Using the future project-generated noise level shown in Table 4.5-5, the L_{dn} can be calculated using assumptions for the number of hours that the equipment runs during the daytime and the nighttime. Noise from the new asphalt plant is the only significant source of noise contributing to measured noise levels to the north and west. A worst case assumption would be that the plant operates its maximum 10-hour period in any 24-hour period during all of the nighttime hours (10:00 PM to 7:00 AM) and one daytime hour. The projected L_{dn} from quarry-generated noise would be less than 40 dBA.

Because the projected noise level is more than 10 dBA below the existing ambient noise level, it would cause no change in the L_{dn} at these residences.

At the Church of the Golden Rule, the projected future L_{dn} noise levels from quarry-generated noise would be about equal to existing noise levels. This is because the quarrying would move to the north and west further away, and the processing equipment would remain in its current location. There would, therefore, be additional shielding afforded to the developed areas at the Church of the Golden Rule.

At the motel, the existing measured noise level in the quietest area of the motel site was 58 dBA L_{dn}. This was at the rear of the motel shielded from vehicular traffic noise on Highway 101. Under normal daytime operations, noise levels generated by the project, resulting primarily from activities at the asphalt plant, is calculated to be about 51 dBA L_{dn} at the motel. The noise from the asphalt plant would be about 7 dBA lower than the existing noise resulting from Highway 101 traffic. When noise from these two sources is added together, noise levels are calculated to increase about 1 dBA L_{dn} above the existing level. This is not a substantial increase. On an annual average basis, the increase would be less. If the asphalt plant operated continuously all night long the L_{dn} resulting from plant-generated noise is calculated to be 56 dBA L_{dn}, 2 dBA less than the existing noise level resulting primarily from U.S. 101 traffic. When the noise from the asphalt plant is added to the existing ambient noise level, the projected increase in noise would be 2 dBA L_{dn}. On an annual average basis, the increase would be about 1 dBA L_{dn}. The increase would not be considered substantial and would cause a less-than-significant impact.

The asphalt plant would operate at night if paving projects require night work. The noise consultants also analyzed whether or not the project would cause a substantial increase in noise by comparing the noise levels expected at night to existing nighttime levels. Table 4.5-5 shows the range of existing noise levels at the sensitive receivers in the area. Receivers located away from U.S. Highway 101 are based on measurements made at LT-1 on Blackhawk Drive. The motel, that is located close to U.S. Highway 101, is based on the data measured directly at the motel at Location LT-2.

Away from the highway existing background noise levels typically range from 25-30 dBA at night. Future project-generated noise at night resulting from the operation of the asphalt plant would be at or below existing background noise levels throughout the area. Most times when nighttime operations occur, noise generated at the asphalt plant site would not be audible at residences to the west. However, there may be times when existing background noise levels are the bottom end of the range (e.g., 25 dBA. Then, the asphalt plant would be barely audible outside the residence at night. Because the outdoor noise levels are projected to be 30 dBA or less outside (except at the motel), the noise levels would be substantially below sleep disturbance thresholds inside residences (as building walls further reduce noise emanating from outside sources).

The nighttime noise level at the motel is calculated to be 50 dBA as a result of a combination of noise from the asphalt processing facility and truck traffic on the access road. The asphalt plant operation and the truck traffic would be intermittently audible at the motel. Ambient noise levels at the motel are elevated because of its proximity to U.S. Highway 101, so the noise from the asphalt facility would not cause a substantial

increase in noise levels at the motel at night. The noise from asphalt plant operations would not cause a substantial increase in nighttime noise at sensitive receivers in the area. The project would have a ***less-than-significant impact*** on the noise environment at nearby sensitive receptors.

Blasting Impacts

Impact 4.5-B The project would generate noise and vibration from quarry blasting.

Rock is loosened from the quarry face by usually blasting three times per year, though some years they blast as many as six times, and some years they do no blasting. They do not blast in the winter due to moisture conditions, and generally do the blasting in the spring. Blasting generates airborne noise and groundborne vibration. The current schedule for blasting is market dependent and normally occurs prior to the quarry running low on materials. With the project, blasting would continue to occur on an infrequent basis based on the demand for material. Noise and vibration levels generated by blasting for quarry expansion would be expected to be similar to existing conditions. The nearest residential unit in the commercial area on Highway 101 north of Black Bart Drive is over 1,000 feet from the quarry site while residences to the west and south are over a mile distant. While residents may be able to hear the blasting, it occurs so infrequently that it is not considered a significant noise impact. The distance is sufficient that the vibration effects are not substantial. If blasting were limited to ten times a year, any change in noise effects would not be substantial. Blasting that occurred more frequently could adversely affect neighbors, and this would be a ***potentially significant impact***.

Mitigation Measures

4.5-B.1 Blasting shall be done as needed, but no more than ten times per year.

Impact Significance After Mitigation

Given the distance to where the nearest sensitive receivers are located from the quarry and the required infrequent scheduling of blasting, the project would result in a ***less-than-significant impact***.

Traffic-Generated Noise

Impact 4.5-C Project-generated traffic noise could increase ambient traffic noise levels along roadways serving the project site.

As described in Section 4.4 above, the project would generate a minor increase in traffic volumes along Highway 101. The project would not generate vehicle trips along Black Bart Drive. Project-generated traffic would not measurably increase existing traffic noise levels (less than 1 dBA Ldn) at sensitive receivers along Highway 101. The project would cause a ***less-than-significant off-site traffic noise impact***.

Construction Noise

Impact 4.5-D Existing noise-sensitive land uses could be exposed to construction noise levels in excess of the significance thresholds.

Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Construction noise impacts primarily occur when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction noise lasts over extended periods of time. Where noise from construction activities exceeds 60 dBA Leq and exceeds the ambient noise environment by at least 5 dBA Leq at noise-sensitive uses in the project vicinity for a duration of one year or more, the impact would be considered significant.

Construction activities generate considerable amounts of noise. Construction-related noise levels are normally highest during the construction of project infrastructure. The infrastructure phase of construction requires heavy equipment that generates the highest noise levels. Typical hourly average construction generated noise levels are about 77 dBA to 89 dBA measured at a distance of 50 feet from the center of the site during busy construction periods. There would be variations in construction noise levels on a day-to-day basis depending on the specific activities occurring at the site.

The majority of noise would occur during construction of the haul road between the quarry entrance and the asphalt plant, and during the construction of the asphalt plant pad. Construction activities along the haul road would occur closest to existing sensitive receivers (approximately 300 feet away). Construction noise levels are calculated to range from 61 to 73 dBA L_{eq} at the motel when roadway construction occurs at its nearest point from these receivers. Construction noise levels could exceed 60 dBA L_{eq} and the ambient noise environment by 5 dBA L_{eq} when construction occurs within approximately 1,400 feet of the noise-sensitive receivers assuming no additional attenuation as a result of intervening shielding provided by topography. Construction of the haul road and of the graded pads is anticipated to last less than one construction season. Project construction activities would not generate noise levels exceeding 60 dBA L_{eq} and the ambient by 5 dBA or more at sensitive receivers in the area, and more for a period greater than one year. This is a ***less-than-significant impact***.

3. Cumulative Impacts

Impact 4.5-E The project plus cumulative increases in traffic could adversely affect residents living along Highway 101.

Future traffic conditions along area roadways are anticipated to increase as a result of planned growth in the area. The project's contribution to the anticipated noise level increases would be less than 1 dBA Ldn. The project would make a less-than-

considerable contribution to future noise levels so the cumulative impact is ***less-than-significant.***

4.6 AIR QUALITY

A. Setting

The Harris Quarry is located in Mendocino County on Ridgewood Grade, just west of Highway 101 and south of Black Bart Drive, about seven miles south of the City of Willits and about 19 miles north of the City of Ukiah. This area lies within the North Coast Air Basin, which includes Del Norte, Humboldt, Mendocino, and northern Sonoma counties. 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. The local air quality regulatory agency responsible for managing air quality in Mendocino County where the Harris Quarry is located is the Mendocino County Air Quality Management District (MCAQMD).

1. Climate and Meteorology

Along its western boundary Mendocino County extends about 80 miles north to south along the Pacific Coast. Moving inland from the coast, the County extends to the crest of the coast range with the width varying from 35 miles in the southern part of the County to 60 miles in the northern portion. Elevations range from sea level along the western edge of the County to between 6,500 and 7,000 feet in the northeastern part of the County. Within 20 miles of the ocean, the landscape rises to 3,000 feet in a series of northwest-southeast trending ridges paralleling the coast, and irregularly alternating with narrow valleys. The alluvial valleys are at 1,000 to 1,500 feet elevation in the central part of the County, and drop to 500 feet at the points where the Eel and Russian Rivers leave the County.

The climate of eastern Mendocino County is transitional between that of the coast and that of the interior of California. The eastern County is characterized by warm, dry summers and cool, wet winters. While the Pacific Ocean moderates temperature, maritime influences in the eastern valleys are lessened and climate becomes more continental because of distance and the mountain ridges that block the inland flow of marine air. Vegetation and soils likewise change as the climate becomes more continental.

The mean annual air temperature in the Ukiah Valley and nearby areas is about 59 degrees F. To the north, Willits and Covelo have a mean annual temperature of about 55 degrees. In summer, the daily fluctuation of temperature is more than 40 degrees in the valleys. Nighttime temperature in summer is 51 degrees, while daytime temperature rises to more than 90 degrees. In eastern Mendocino County, 90 to 95 percent of the total annual precipitation falls from October through April. Mean totals are as high as 60 inches at the Russian River drainage way in the south, and range from 45 to 70 inches at the Eel River drainage way. Precipitation is lowest in the southern valleys and highest in the northern mountains. Annual average precipitation near the project site is about 47 inches, measured at the California Department of Forestry Howard Forest Station located less than one mile from the quarry site.

The prevailing winds in the area are from the west through northwest, with local variations due to topography. Average wind speeds in the project vicinity are about 5

miles per hour. During daylight hours, up-canyon local winds predominate. In the evening hours down-canyon "drainage" flows along watercourses predominate. In the central interior of the County, two major river valleys run in a north-south direction. The Eel River drains northward into Humboldt County along a relatively narrow river canyon. The Russian River drains southwards in a relatively wide canyon into Sonoma County.

All regions of the County are affected by inversions. Inversion layers, where warm air overlays cooler air, frequently occur and trap pollutants close to the ground. In the coastal areas these inversions are typically elevated above the cool marine layer near the ground. In winter, ground-based inversions are formed during windless, clear-sky conditions as cold air collects in low-lying areas such as valleys and canyons.

2. Regulatory Framework

Air quality and air pollution sources are regulated by Federal, State, regional, and local regulatory agencies. Air quality regulations provide the standards by which air quality is determined and institute controls on air pollution sources to improve air quality. The Federal Clean Air Act established the national ambient air quality standards and delegated the enforcement of air pollution control regulations to the states. In California, the California Air Resources Board (CARB) develops and enforces air regulations, but delegates the responsibility of stationary emission source regulation to local air pollution control agencies. In the project area, the MCAQMD is responsible for air pollution source regulation. Mobile sources of air pollutant emissions are regulated on a statewide basis by the CARB. The air pollutants of concern and the roles of the agencies primarily responsible for managing the air quality within the project area and relevant air quality regulations are further discussed below.

Federal Air Quality Regulations

Federal Clean Air Act

The Federal Clean Air Act (Federal Act) was established in an effort to assure that acceptable levels of air quality are maintained in all areas of the United States. Air quality is characterized by the presence of pollutants that fall into two basic categories; criteria air pollutants and toxic or hazardous air contaminants. Criteria air pollutants refer to a group of pollutants for which the regulatory agencies have adopted ambient air quality standards and pollution management and control strategies. Toxic or hazardous air contaminants refer to a category of air pollutants that have potential adverse health effects but do not have an associated ambient air quality standard. These pollutants are called hazardous air pollutants (HAPs) in Federal law and toxic air pollutants (TACs) in California law.

Criteria Air Pollutants

The Federal Act requires the EPA to establish ambient air quality standards for air pollutants that cause or contribute to air pollution and that may reasonably be anticipated to endanger public health. Pollutants with air quality standards are called criteria pollutants. National Ambient Air Quality Standards (NAAQS or national standards) have been established for seven pollutants: carbon monoxide (CO), ozone (O_3), nitrogen

dioxide (NO_2), particulate matter, which includes both respirable particulate matter, PM10 (particulate matter 10 microns or less in diameter) and fine particulate matter, PM2.5 (particulate matter 2.5 microns or less in diameter), sulfur dioxide (SO_2), and lead (Pb). There can be two standards for each criteria pollutant – primary and secondary NAAQS. The primary NAAQS establish the acceptable ambient concentration of each criteria pollutant, the attainment and maintenance of which protect the public health with an adequate margin of safety. The secondary NAAQS are the ambient concentration levels requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of that pollutant in the ambient air. Often the secondary standard is the same as the primary standard.

Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing it to an appropriate ambient air quality standard. Depending on the pollutant and its associated effects, the standards may be short term, from one to twenty-four hours, or an annual average. In general, short-term standards represent the maximum acceptable concentrations that may be reached but not exceeded more than once per year. Annual standards are maximum acceptable concentrations that may be reached but not exceeded. Table 4.6-1 lists the primary and secondary NAAQS, along with the California Ambient Air Quality Standards (CAAQS or State standards). Potential health effects and primary sources of criteria pollutants are described below.

Nitrogen Dioxide. Nitrogen dioxide is a reddish-brown gas that is a by-product of combustion processes. During combustion processes at high temperatures, nitrogen from the atmosphere and the fuels being burned 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 quickly converts to NO_2 and is easily measured in the atmosphere. Nitrogen dioxide also contributes to ground-level ozone formation. Adverse health effects associated with exposure to high levels of nitrogen dioxide include the risk of acute and chronic respiratory illness.

Ozone. Ground-level ozone (ozone) is the principal component of smog. It is not directly emitted into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. VOCs and NOx are known as precursor compounds for ozone. Ozone levels are highest during late spring through early summer when precursor emissions are high and meteorological conditions are favorable for the complex photochemical reactions to occur. Ozone is a regional air pollutant since it is not emitted directly by sources, but is formed downwind of sources of VOCs and NOx emissions. Adverse health effects of ground-level ozone include respiratory impairment and eye irritation.

Carbon Monoxide. Carbon monoxide (CO) is a non-reactive pollutant that is colorless and odorless, and is toxic in high concentrations. It is formed by the incomplete combustion of fuels. The largest source of CO emissions is motor vehicles. Wood stoves and fireplaces also contribute to high levels of CO, particularly in the wintertime. Unlike ozone and NO_2, CO is directly emitted to the atmosphere without additional

chemical conversion. The highest CO concentrations generally occur during the nighttime and early mornings in late fall and winter. CO levels are strongly influenced by meteorological factors such as wind speed and atmospheric stability. High CO concentrations can develop during periods of light winds combined with ground-level temperature inversions, typical of wintertime conditions during the evening through early morning hours. Adverse health effects of carbon monoxide include the impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin, aggravation of cardiovascular disease, impairment of central nervous system function, and fatigue, headache, confusion, and dizziness. Exposure to carbon monoxide can be fatal in the case of very high concentrations.

Particulate Matter. Respirable particulate matter, PM10, and fine particulate matter, 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 and cause adverse health effects. 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) can have greater effects on health than PM10. Because these particles are so small they are able to penetrate to the deepest parts of the lungs. Scientific studies have identified 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. Very small particles of certain substances (e.g., sulfates and nitrates) can also cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health.

Several forms of particulate matter, in particular diesel particulate matter, have adverse health effects at concentrations well below the standards established for PM10 or PM2.5. The CARB identified diesel exhaust particulate matter as a toxic air contaminant based on its potential to cause cancer, premature death, and other health problems. Diesel exhaust also contributes to fine particulate matter (PM2.5) air quality problems. Thus, diesel particulate matter presents both an air quality concern, as well as a health risk concern. As such, diesel particulate matter emissions require separate evaluation as a toxic air contaminant in order to assess potential health risks.

Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as mining and demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. In addition to health effects, particulates also can damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is more easily filtered by human breathing passages. This dust is of concern more as a soiling nuisance rather than a health hazard.

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 μg/m^3 for an annual average. PM2.5 standards were first promulgated by the EPA in 1997 and were recently revised to lower the 24-hour PM2.5 standard to 35 μg/m^3 for 24-hour exposures and revoked the annual PM10 standard due to lack of scientific evidence correlating long-term exposures of ambient PM10 with health effects. The CARB has adopted an annual average PM2.5 standard which is set at 12 μg/m^3, which is more stringent than the Federal standard of 15 μg/m^3.

Sulfur Dioxide. Sulfur dioxide is a colorless gas with a strong odor and potential to damage materials. It is produced by the combustion of sulfur containing fuels such as oil and coal. Refineries, chemical plants, and pulp mills are the primary industrial sources of sulfur dioxide emissions. Sulfur dioxide concentrations in Mendocino County are well below the ambient standards. Adverse health effects associated with exposure to high levels of sulfur dioxide include aggravation of chronic obstruction lung disease and increased risk of acute and chronic respiratory illness.

Lead. Lead occurs in the atmosphere as particulate matter. It was primarily emitted by gasoline-powered motor vehicles; however, the use of lead in fuel has been virtually eliminated. As a result of lead being eliminated from fuels, levels throughout the U.S. have dropped dramatically in the past 20 years. Dust from old lead paints represent very localized lead problems. Lead concentrations measured at ambient monitoring stations in California are well below the ambient standards.

Federal Requirements

Each state is divided into air basins based on topographic, geographic, and meteorological conditions. Each air basin is then assessed to determine if the area meets the NAAQS. Air basins or portions thereof have been classified as either "attainment" or "nonattainment" for each criteria air pollutant based on whether or not compliance with the standards have been achieved.

If an area does not meet the NAAQS over a set period of time, the EPA designates the area as a "nonattainment" area for that particular pollutant and sets deadlines for bringing the area into compliance with the standards. These deadlines vary by pollutant, the current level of air pollution in the air basin, and the ability of each region to meet the deadline. The EPA requires states that have areas that are not in compliance with the national standards to prepare and submit air quality plans showing how and when the standards will be met. These plans are referred to as State Implementation Plans (SIPs). If the states cannot show how the standards will be met, then they must show progress toward meeting the standards. Under severe cases, the EPA may impose a Federal plan to show progress in meeting the Federal standards.

SIPs typically contain measures to reduce air pollution and specific strategies for achieving attainment. SIPs for nonattainment areas must require new sources to achieve the "lowest achievable emission rate." The Federal Act also contains specific measures relating to air pollution from cars, trucks, and other "mobile sources." States have the authority to implement transportation control measures to reduce mobile source pollution. Except for California, states do not have the authority to prescribe the level of pollutants emitted directly from the tailpipe of mobile sources. The Federal Act also

Table 4.6-1
California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards [a]	
			Primary [b,c]	Secondary [b,d]
Ozone	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as primary
	1-hour	0.09 ppm (180 µg/m^3)	—[e]	Same as primary
Carbon monoxide	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
Nitrogen dioxide	Annual	0.03 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as primary
	1-hour	0.18 ppm (339 µg/m^3)	0.100 ppm[f] (189 µg/m^3)[f]	—
Sulfur dioxide	Annual	—	0.030 ppm (80 µg/m^3)	—
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	—
	3-hour	—	—	0.5 ppm (1300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	—
PM_{10}	Annual	20 µg/m^3	—[g]	Same as primary
	24-hour	50 µg/m^3	150 µg/m^3	Same as primary
$PM_{2.5}$	Annual	12 µg/m^3	15 µg/m^3	
	24-hour	—	35 µg/m^3 [g]	
Lead	Calendar quarter	—	1.5 µg/m^3	Same as primary
	30-day average	1.5 µg/m^3	—	—

Notes: ppm = parts per million
µg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter

(a) Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.

(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

(e) The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005. A new 8-hour standard was established in May 2008.

(f) The form of the 1-hour NO_2 standard is the 3-year average of the 98th percentile of the daily maximum 1-hour average concentration.

(g) The annual PM_{10} standard was revoked by U.S. EPA on September 21, 2006 and a new $PM_{2.5}$ 24-hour standard was established.

(h) The U.S. EPA established a new 1-hour sulfur dioxide standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.

contains specific measures to be included in the SIP for areas that have not attained the ozone and particulate matter NAAQS.

Areas with monitored air pollutant concentrations lower than ambient air quality standards are designated as attainment areas on a pollutant-by-pollutant basis. Areas are designated as unclassified when data are insufficient to have a basis for determining the area's attainment status. From a regulatory standpoint, unclassified areas are treated the same as an attainment area. Table 4.6-2 shows the attainment status of the project area with respect to the National and State air quality standards. Mendocino County is in attainment or unclassified with respect to the national and State air quality standards for all criteria pollutants except for PM10, which is classified as nonattainment with respect to the State standards.

Table 4.6-2
Attainment Status of Mendocino County

Pollutant	Federal	State
Ozone (O3) - 1 hour	-	Attainment
Ozone (O3) - 8 hour	Unclassified/Attainment	Attainment
Carbon Monoxide (CO)	Unclassified/Attainment	Attainment
Nitrogen Dioxide (NO_2)	Unclassified/Attainment	Attainment
Sulfur Dioxide (SO_2)	Unclassified	Attainment
Respirable Particulates (PM10)	Unclassified	Nonattainment
Fine Particulate Matter (PM2.5)	Unclassified/Attainment	Unclassified

Stationary Source Control Measures

The Federal Act authorizes the EPA to adopt regulations specifying pollutant levels that may be emitted from newly constructed stationary sources. These regulations, called New Source Performance Standards (NSPS), are implemented for different categories of stationary emission sources.

One such NSPS regulation has been promulgated for non-metallic mineral processing operations (40 CFR 60 Subpart OOO), which includes rock and sand and gravel quarry operations. This performance standard includes particulate matter emission limitations and visible emissions (opacity) limits for point and fugitive sources at quarries and other facilities. The regulation applies to various equipment components at quarries including crushers, grinders, screening operations, belt conveyors, and storage bins, that were constructed, reconstructed, or modified after August 31, 1983. Existing equipment at the Harris Quarry is subject to these requirements and any new equipment that is acquired to replace old equipment will also be subject to these requirements.

The Federal Act also requires stationary sources that emit or may emit large quantities of pollutants (called "major sources") to obtain a federally enforceable permit to operate, called a Title V permit or a Part 70 permit, which is implemented and enforced by the local air agency, in this case the MCAQMD. A major source is defined as a source that emits or has the potential to emit either 100 tons per year or more of any criteria

pollutant, ten tons per year of any single Hazardous Air Pollutant (HAP), or 25 tons per year of any combination of HAPs.

In May 2010, the EPA issued a final rule that addressed greenhouse gas (GHG) emissions from stationary sources and requirements under the Title V and Prevention of Significant Deterioration (PSD) permitting programs. This rule is known as the PSD and Title V Greenhouse Gas Tailoring Rule, or Tailoring Rule. After July 1, 2011, new sources with GHG emissions of at least 100,000 tons per year will be subject to PSD permitting requirements. Additionally, new and existing sources with GHG emissions of at least 100,000 tons per year will be subject to Title V permitting requirements.

The Harris Quarry is not a major source under the PSD or Title V permit regulations and will not become a major source with the proposed increase in quarry production levels and addition the asphalt facility.

Mobile Source Control Measures – Diesel Engines

In addition to setting emission standards for stationary sources, the EPA also sets nationwide emission standards for mobile sources, which include on-road (highway) motor vehicles such trucks, buses, and automobiles, and non-road (off-road) vehicles and equipment used in construction, agricultural, industrial, and mining (such as bulldozers and loaders). The EPA also sets nationwide fuel standards. California also has the ability to set motor vehicle emission standards and standards for fuel used in California, as long as they are the same or more stringent than the Federal standards.

In the past several years the EPA has established a number of emission standards for on-road and non-road heavy-duty diesel engines used in trucks and other equipment. This was done in part because diesel engines are a significant source of particulate matter (PM10 and PM2.5) and since the EPA has identified diesel particulate matter as a probable carcinogen. Emissions from on-road heavy-duty truck and bus engines are estimated to account for about 30 percent of the NOx emissions and 25 percent of the PM emissions from mobile sources (EPA, 2000). Non-road diesel engine emissions were estimated to be about 40 percent of the total mobile source PM2.5 inventory and 25 percent of the NOx inventory in 1996. Implementation of the heavy-duty diesel on-road vehicle standards (EPA, 2001) and the non-road diesel engine standards (EPA, 1998 and 2004) are estimated to reduce PM and NOx emissions by from diesel engines by 90 to 95 percent.

In concert with the diesel engine emission standards, the EPA has also substantially reduced the amount of sulfur allowed in diesel fuels. The sulfur contained in diesel fuel is a significant contributor to the formation of particulate matter in diesel-fueled engine exhaust. The new standards reduced the amount of sulfur allowed by 97 percent for highway diesel fuel (from 500 ppmw to 15 ppmw), and by 99 percent for off-highway diesel fuel (from about 3,000 ppmw to 15 ppmw). The low sulfur highway fuel (15 ppmw sulfur), also called ultra low sulfur diesel (ULSD), is currently required. For off-highway diesel fuel the sulfur content will be reduced in phases.

All of the above Federal diesel engine and diesel fuel requirements have been adopted by California, in some cases with modifications making the requirements more stringent or the implementation dates sooner.

Hazardous Air Pollutants

The Federal Act also regulates the emission of hazardous air pollutants. HAPs are air pollutants known to be, or reasonably anticipated to be, carcinogenic, mutagenic, teratogenic, neurotoxic, or cause reproductive dysfunction, or are acutely or chronically toxic. Section 112 of the Federal Act (42 U.S.C. § 7412) contains a list of specific substances that are HAPs. These requirements for HAPs generally apply to major sources of HAPs and/or to specific source categories. The Harris Quarry is not a major source of HAPs and will not become a major source with the proposed increase in quarry production or construction of the asphalt facility.

State Air Quality Regulations

California Clean Air Act

Air pollution in California is regulated under the provisions of the California Clean Air Act (State Act). These statutes provide the basis for implementing the Federal Act. The CARB is responsible for establishing and reviewing the State standards, compiling the California SIP, securing approval of that plan from the EPA, and identifying toxic air contaminants. CARB also regulates mobile emission sources in California, such as construction equipment, trucks, and automobiles. The State Act divides implementation responsibility between the CARB and local or regional agencies called air quality management districts or air pollution control districts.

The air districts are primarily responsible for implementing and enforcing Federal and State regulations for stationary sources at industrial and commercial facilities within their jurisdictions and for preparing the regional 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 California SIP. The local air districts also have the responsibility and authority to adopt transportation control measures and emission reduction programs for indirect and area-wide emission sources.

The CARB oversees air district regulation of stationary sources and is the agency primarily responsible for controlling air pollution from mobile sources in California. Regulations have been adopted at both EPA and CARB levels that set specific emission standards for vehicles. As older vehicles are retired and replaced with newer, cleaner vehicles (called "fleet turnover"), it is expected that the air quality will improve. Consistent with this notion, most air quality planning documents project reduced vehicle emissions in the future.

Local councils of governments, county transportation agencies, cities and counties, and various nongovernmental 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. The MCAQMD is the regional agency with jurisdiction over Mendocino County. The MCAQMD 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.

Criteria Air Pollutants

The California Clean Air Act outlines a program for areas in the State to attain the California Air Quality Standards (CAAQS) by the earliest practical date. The California Clean Air Act set more stringent air quality standards, as shown in Table 4.6-1, for most of the pollutants covered under the Federal standards. Additionally, California has adopted ambient air quality standards for vinyl chloride, hydrogen sulfide, sulfates, and visibility-reducing particulates.

In a manner similar to the Federal requirements, the California Clean Air Act requires designation of attainment and nonattainment areas with respect to CAAQS. The California Clean Air Act also requires that local and regional air districts prepare a Clean Air Plan (CAP) if the State air quality standards for CO, SO_2, NO_2, or ozone are violated in their district. These CAPs include information on existing air quality in the region, an inventory of current and forecasted future emissions, emission reductions required to meet the standards, and the control measures required to achieve the emission reduction. The CAP must show satisfactory progress in attaining the State air quality standards. The California Clean Air Act requires that the State air quality standards be met as expeditiously as practicable but unlike the Federal Clean Air Act, does not set precise attainment date deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

Unlike for other pollutants an attainment plan is not required for areas that violate the State PM10 standards. While the MCAQMD is not required to prepare a PM10 attainment plan, the District is required to prevent significant deterioration of local air quality and make reasonable efforts toward achieving attainment status for all pollutants. However, the MCAQMD has prepared a Particulate Matter Attainment Plan which lists PM10 control measures it considers cost-effective and developed a schedule for implementation of the plan.

Toxic Air Contaminants

Toxic Air Contaminants (TAC) are a comprised of large group of compounds known to cause short-term (acute) and/or long-term (chronic or carcinogenic) adverse human health effects. TACs are considered separately from criteria pollutants in the regulatory process. Unlike criteria pollutants, there are no ambient air quality standards for evaluation of TACs. Instead, TAC emissions are generally evaluated based on the degree of health risk that could result from exposure to these pollutants.

TAC sources include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), some agricultural activities, and mobile sources. In general, mobile sources, particularly those with diesel engines, contribute more significantly to health risks than stationary sources. In comparison to other air toxics the CARB has identified and controlled, diesel particulate matter emissions are responsible for about 70 percent of the total ambient air toxics risk. In addition to these general risks, diesel particulate matter can also present elevated localized or near-source exposures.

The State requires the local air districts to quantify and prioritize emissions from individual facilities. High priority facilities must then perform a health risk assessment,

and if specific thresholds are exceeded, they are required to communicate the results to the public in the form of notices and public meetings. Depending on the level of risk, facilities can be required to implement varying levels of risk reduction measures. Regulation of TACs from mobile sources has traditionally been implemented through use of engine emission standards for on-road motor vehicles and through specifications for gasoline and diesel fuel sold in California. However, as discussed below, due to the significant contribution to health risks in the State from diesel exhaust, the CARB has implemented a diesel exhaust control program.

CARB Diesel Exhaust Control Program

In August of 1998, the CARB formally identified particulate matter emitted from diesel-fueled engines (diesel particulate matter [DPM]) as a TAC that is carcinogenic (causes cancer) in addition to other adverse health effects. Diesel engines emit TACs in both gaseous and particulate forms. Diesel particulate matter is of particular concern since it can be distributed over large regions, thus leading to widespread public exposure. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by EPA as HAPs, and by CARB as TACs. Diesel engines emit particulate matter at a rate about 20 times greater than comparable gasoline engines. Because the vast majority of diesel exhaust particles are very small (92% to 94% of their combined mass consists of particles less than 2.5 micrometers in diameter), the particles are inhaled into the lung. Like other particles of this size, a portion will eventually become trapped within the lung. While the gaseous portion of diesel exhaust also contains TACs, CARB uses diesel particulate matter as a surrogate for all the compounds in diesel exhaust that are carcinogenic.

To address the issue of diesel emissions in the State, CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB, 2000a) and the *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* (CARB, 2000b). The Diesel Risk Reduction Plan was adopted by the CARB in September 2000. In addition to requiring more stringent emission standards for new on-road and off-road mobile sources and stationary diesel-fueled engines to reduce particulate matter emissions by 90 percent, a significant component of the plan involves application of emission control strategies to existing diesel vehicles and equipment. The projected emission benefits associated with full implementation of this plan, including existing and new Federal measures, are reductions in diesel particulate matter associated cancer risks by 75 percent in 2010 and 85 percent by 2020. The measures in the plan will substantially reduce localized risks associated with activities that expose nearby individuals to diesel particulate matter emissions.

Many of the measures of the Diesel Risk Reduction Plan have been approved and adopted, including the Federal on-road and non-road diesel engine emission standards for new engines in 2004 and 2007 previously discussed, as well as adoption of regulations for low sulfur fuel in California. The California diesel fuel regulations are similar to the Federal regulations in that they require the maximum sulfur content to be 15 ppmw, but they also require reductions in the aromatic content. Reductions in aromatic content reduce emissions of several other toxic substances other than diesel particulate matter, including benzene and polynuclear aromatic hydrocarbons (PAHs). Additionally, the low sulfur diesel fuel requirements are to be accelerated compared to

the Federal requirements. The California low sulfur diesel fuel is currently required for use in both on-road and non-road engines in California.

CARB has adopted and implemented a number of regulations for stationary and mobile sources to reduce emissions of DPM. Several of these regulatory programs affect medium and heavy duty diesel trucks that represent the bulk of DPM emissions from California highways. These regulations include the solid waste collection vehicle (SWCV) rule, in-use public and utility fleets, and the heavy-duty diesel truck and bus regulations.

In December 2008 CARB approved a new regulation to reduce emissions of DPM and nitrogen oxides from existing on-road heavy-duty diesel fueled vehicles. The regulation requires fleets that operate in California to reduce diesel truck and bus emissions by retrofitting or replacing existing engines. Amendments were considered in December 2010 to provide more time for fleets to comply. The amended regulation would require installation of PM retrofits beginning January 1, 2012 and replacement of older trucks starting January 1, 2015. By January 1, 2023, nearly all vehicles would need to have 2010 model year engines or equivalent.

In July 2007, the CARB adopted regulations to reduce DPM and NOx emissions from in-use (existing) off-road heavy-duty diesel vehicles (e.g., loaders, tractors, bulldozers, backhoes, off-highway trucks, etc.). The regulations apply to diesel-powered off-road vehicles with engines 25 horsepower (hp) or greater. The regulations are intended to reduce particulate matter and NOx exhaust emissions by requiring owners to turn over their fleet (replace older equipment with newer equipment) or retrofit existing equipment in order to achieve specified fleet-averaged emission rates. The regulations call for different requirements and an implementation schedule that depends on the size of the fleet. Large fleets are those with a total combined equipment horsepower of more than 5,000 hp, medium fleets are those with a total combined horsepower between 2,500 and 5,000 hp, while small fleets are those with a total combined horsepower of 2,500 hp or less. The Northern Aggregates, Inc. fleet, which is comprised of more equipment than is operated at the Harris Quarry, is in the medium fleet category.

In December 2010 the CARB amended these regulations to change the requirements and implementation schedule. The amended regulations delay the original compliance timeline for all fleets by four years, making the first compliance deadline for January 1, 2014, for large fleets, January 1, 2017 for medium fleets, and January 1, 2019 for small fleets. Implementation of this regulation, in conjunction with stringent Federal off-road equipment engine emission limits for new vehicles, will significantly reduce emissions of DPM and NOx.

Crystalline Silica

Crystalline silica is a component of soil, sand, granite, and many other minerals and has been associated with potential respiratory health effects. Respirable-sized particles of crystalline silica may be formed when workers chip, cut, drill, or grind the base materials that contain it. If the base rock material at a quarry contains crystalline silica, the fugitive dust generated during quarrying activities may contain crystalline silica. If respirable crystalline silica dust enters the lungs it can cause the formation of scar tissues (silicosis) which can be disabling or even fatal, reducing the lungs' ability to take in

oxygen and increasing the susceptibility to lung infections. The non crystalline form of silica (amorphous silica) is not nearly as toxic, since it usually does not cause silicosis. Crystalline silica has been identified as a TAC with chronic non-cancer health effects by the California Office of Environmental Health Hazard Assessment (OEHHA). OEHHA has established an acceptable exposure level for crystalline silica's potential health effect, but since it is not a TAC, it is not specifically regulated by the MCAQMD.

Asbestos Toxic Air Control Measure

On July 22 of 2002, the CARB adopted an Asbestos Airborne Toxic Control Measure (ATCM) 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 asbestos/serpentine rock**.** The MCAQMD enforces the requirements of the asbestos ATCM. The MCAQMD may grant an exemption to the ATCM requirements if a geological evaluation demonstrates that ultramafic rock or serpentine is not likely to be found. Before an exemption can be granted, the owner/operator must provide a copy of a report detailing the geologic evaluation to the MCAQMD for consideration.

Local Air Quality Regulations

Mendocino County General Plan

Under the Air Quality component of the Mendocino County General Plan air quality goals and policies for the County are identified. The following goals and policies would apply to the proposed project:

Goal RM-6: *Air quality throughout Mendocino County that meets or exceeds all state and federal standards for all persons.*

Policy RM-35*: The County shall work to maintain 'attainment status', for state and federal air quality standards which are currently met, and toward attainment for currently exceeded standards.*

Policy RM-37*: Public and private development shall not exceed Mendocino County Air Quality Management District emissions standards.*

Policy RM-41*: Reduce dust generation from unpaved roads.*

Policy RM-43*: Reduce the effects of earth-moving, grading, clearing and construction activities on air quality.*

Policy RM-45*: Encourage the use of alternative fuels, energy sources and advanced technologies that result in fewer airborne pollutants.*

Policy RM-46*: Reduce or eliminate exposure of persons, especially sensitive populations, to air toxics.*

***Policy RM-47**: Minimize the exposure of sensitive uses, such as residences, schools, day care, group homes or medical facilities to industrial uses, transportation facilities, or other sources of air toxics.*

***Policy RM-48**: Reduce potential health hazards from disturbance in areas classified as likely to contain Naturally Occurring Asbestos (NOA)*

***Policy RM-50**: Mendocino County acknowledges the real challenge of climate change and will implement existing strategies to reduce greenhouse gas emissions and incorporate future measures that the State adopts in the coming years.*

Mendocino County Air Quality Management District (MCAQMD) Regulations

The MCAQMD is responsible for permitting and inspection of stationary sources; enforcement of regulations, including setting fees, levying fines, and enforcement actions; and ensuring that public nuisances are minimized.

The proposed increase in production levels for the proposed project and the construction of the asphalt plant would require new permits to be issued for the asphalt plant and the existing quarry air quality permit issued by the MCAQMD to be modified. The proposed aggregate production increase to 200,000 cubic yards (418,500 tons) per year would require a new air quality permit to be issued. The district will not approve any production increases until the project has a valid Use Permit from the County allowing the increased quarry production.

The facility and its emission sources are subject to MCAQMD rules and regulations contained in the most recent version of the *Rules and Regulations of the Mendocino County Air Quality Management District.* The District's rules and regulations that may apply to the permitting proposed project include:

Regulation 1, Chapter 1 - General Provisions. This contains the general district requirements as well as a definition of significant emission levels.

Chapter 2 - Permits. This chapter contains specific requirements for permitting facilities. It requires all new or modified sources to obtain authorization to construct and operate and outlines the requirements for obtaining a permit. For sources, such as the proposed project that are subject to New Source Performance Standards (NSPS) requirements, an evaluation of best available control technology (BACT) is required for pollutants emitted in significant amounts. Additionally, this chapter contains requirements for evaluation of hazardous or toxic air contaminants. Both State and Federal requirements are addressed. As discussed earlier, the proposed project will not be a major source of hazardous air pollutants.

Additionally, the MCAQMD recently adopted *Rule 1-221 Federal Permitting for Greenhouse Gas Emissions*. This rule defines the GHG emission levels for major stationary sources (new, existing, and modifications to existing major sources) and identifies permitting requirements for major sources of GHGs. For new stationary sources the GHG emission threshold is 100,000 tons per year of CO2e.

Chapter 4 - Prohibitions. This chapter contains general limitations associated with air emission source operations including those relating to public nuisance, visible emissions, particulate matter emissions, fugitive dust, sulfur oxide emissions, and Federal New Source Performance Standards. Prohibitions applicable to the proposed project are addressed further below.

> *Rule 1-400(a) Public Nuisance* – This is a general requirement that is applicable to odors, as well as other air contaminants. Specifically, the rule states that a person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or that cause or have a natural tendency to cause injury or damage to business or property.
>
> *Rule 1-410 Visible Emissions* – This applies to any source at the facility and limits visible emissions to no more than 20 percent opacity for more than a 3-minute period in any one hour.
>
> *Rule 1-420 Particulate Matter* – This rule imposes particulate matter emission rate limitations and is applicable to combustion and non-combustion sources. Combustion sources do not include mobile sources. The proposed project will have both combustion and non-combustion sources that will be subject to these requirements.
>
> *Rule 1-490 New Source Performance Standards* – This rule requires new or modifications to existing sources to comply with the rules, standards, criteria, and requirements of 40 CFR Part 60 (New Source Performance Standards). As stated previously, the Harris Quarry is subject to the requirements of the NSPS Subpart OOO for Non-metallic Materials Processing Plants.

In addition, there are other MCAQMD rules and regulations, not detailed here, which apply to the proposed project but are administrative or descriptive in nature. These include rules associated with fees, enforcement and penalty actions, and variance procedures.

3. Existing Air Quality Conditions

The ambient air quality in a given area depends on the quantities and types of pollutants emitted within the area, the location and distribution of emission sources, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, as well as the surrounding topography of the air basin. Meteorological conditions such as wind speed and direction, atmospheric stability, and for photochemical pollutants, sunlight, all combine to affect the atmosphere's ability to mix, transform, and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while short-term variations result from changes in atmospheric conditions.

Air quality in Mendocino County and the project area is generally very good due to the rural nature of the region. There are infrequent exceedances of the air quality standards

for particulate matter. The existing air quality conditions in the project region can be characterized using long-term monitoring data collected in the region over a period of years. Ambient ozone, NO_2, CO, and particulate matter (PM10 and PM2.5) concentrations are measured at several monitoring stations in the project region. The pollutant of greatest concentration in the MCAQMD is particulate matter. Ambient PM2.5 is measured in both Willits (7 miles north of the project site) and Ukiah (19 miles south of the project site). Measured pollutant concentrations for the last three years (2007 through 2009) are summarized in Table 4.6-3.

As seen from Table 4.6-3, there have been no exceedances of the National or State air quality standards over the last three years except for PM10 in 2008. The high 24-hour average PM10 concentrations in 2008 were due to statewide fires beginning on June 20th, 2008.

In Mendocino County ambient particulate matter concentrations exhibit a seasonal pattern. Particulate matter concentrations typically increase during the winter months and are generally at their lowest levels during the summer months. The higher wintertime concentrations are attributed to wood smoke from outdoor burning and use of wood stoves. In general, wood smoke is much more prevalent during the winter months and dust levels are higher in the summer and early fall (MCAQMD, 2005).

Mendocino County is classified as Federal attainment or unclassified for all criteria pollutants and is State attainment or unclassified for all pollutants, except for PM10 for which the area is classified as nonattainment.

4. Existing Emissions in Mendocino

Mendocino County Emissions

The CARB estimated annual average daily air emissions in 2010 for Mendocino County are presented in Table 4.6-4. This table shows both the man-made (anthropogenic) emissions as well as the natural (nonanthropogenic) emissions for the County. Mobile sources are clearly one of the largest contributors to anthropogenic (man made) VOCs, CO, NO_X, and SO_X emissions, while their contribution to particulate matter emissions is much smaller. For VOC emissions in the County, the natural emission sources are clearly the largest contributors.

Table 4.6-3
Maximum Measured Short Term and Annual Average
Air Pollutant Concentrations at Willits and Ukiah Monitoring Stations

Pollutant & Location	Averaging Period	Air Quality Standard		2007	2008	2009
		National	State			
Respirable Particulate Matter (PM10)						
Willits	24-Hour (µg/m^3)	150	50	47.0	**111.8**	NA
Ukiah				27.4	**220.6**	NA
Willits	Annual (µg/m^3)	-	20	13.6	19.5	NA
Ukiah				12.2	19.3	NA
Fine Particulate Matter (PM2.5)						
Ukiah	24-Hour (µg/m^3)	35	-	16.4	31.6	25.9
Ukiah	Annual (µg/m^3)	15	12	4.7	7.9	NA
Ozone (O_3)						
Willits	1-Hour (ppm)	-	0.09	0.061	0.054	NA
Ukiah				0.080	0.090	0.094
Willits	8-Hour (ppm)	0.075	0.070	0.052	0.049	NA
Ukiah				0.068	0.072	0.064
Carbon Monoxide (CO)						
Willits	8-Hour (ppm)	9	9.0	1.12	1.01	NA
Ukiah				1.67	3.38	NA
Nitrogen Dioxide (NO_2)						
Willits	1-Hour (ppm)			0.037	0.032	NA
Ukiah		0.100	0.18	0.036	0.110	0.094
Willits	Annual (ppm)			0.008	NA	NA
Ukiah		0.053	0.030	0.007	0.007	0.005

Notes: ppm = parts per million
µg/m^3 = micrograms per cubic meter
Values reported in bold exceed ambient air quality standard
NA = data not available.

Baseline Quarry Operation Emissions

The Harris Quarry is a currently operating quarry that extracts, processes (crushes, screens, and segregates), and sells aggregate to retail customers. Quarry operation typically occurs weekdays during the daytime (7 a.m. to 4 p.m.). Currently, the aggregate crushing operations at the quarry do not operate five days per week, every week during the summer.

The quarry production rate is currently limited to a maximum of 75,000 cubic yards per year and currently operates approximately at this level. This production rate was used to represent existing (baseline) conditions in 2010. Future conditions assume the maximum quarry production level of 200,000 cubic yards per year plus the import of 10,000 tons of recycle material (primarily concrete and asphalt).

Table 4.6-4
2010 Estimated Annual Average Emissions (Tons/Day) For Mendocino County

Source Type/Category	VOCs	CO	NO_X	SO_X	PM10	PM2.5
Stationary Sources						
Fuel Combustion	0.1	0.2	0.5	0.4	0.1	0.1
Waste Disposal	0.0	-	-	-	-	-
Cleaning and Surface Coating	0.6	-	-	-	-	-
Petroleum Production and Market	0.4	-	-	-	-	-
Industrial Processes	0.2	-	-	-	0.2	0.1
Subtotal	**1.3**	**0.2**	**0.5**	**0.4**	**0.4**	**0.2**
Area wide Sources						
Solvent Evaporation	2.1	-	-	-	-	-
Miscellaneous Processes	2.0	20.5	0.5	0.3	20.1	4.7
Subtotal	**4.1**	**20.5**	**0.5**	**0.3**	**20.1**	**4.7**
Mobile Sources						
On-Road Motor Vehicles	3.4	30.3	7.8	0.1	0.3	0.2
Other Mobile Sources	3.0	15.5	14.6	5.8	1.2	1.1
Subtotal	**6.4**	**45.8**	**22.4**	**5.9**	**1.5**	**1.4**
Natural Sources						
Biogenic Sources	117.7	6.1	0.2	0.1	0.6	0.5
Subtotal	**117.7**	**6.1**	**0.2**	**0.1**	**0.6**	**0.5**
County Total	**129.6**	**72.6**	**23.6**	**6.6**	**22.6**	**6.8**

Source: California Air Resources Board - http://www.arb.ca.gov/app/emsinv/emseic1_query.php

On-site emission sources at the quarry include stationary, mobile, and fugitive sources. The stationary sources at the quarry include one large diesel generator (2,012 hp), two small diesel generators (22 hp and 30 hp), and sources associated primarily with quarry processing facility; a feeder, primary jaw crusher, two secondary cone crushers, three screens, conveyors, stacking conveyors, and one wash plant (in place, but non-operational). Emissions from these sources are minimized by use of water/foam spray systems on the crushers and at transfer and processing points to reduce any dust generated.

Other emission sources at the quarry include fugitive dust from quarry maintenance and excavation activities and aggregate loading into haul trucks via loaders. On-site mobile equipment includes one bulldozer, three loaders (two in operation and one for spare use), one excavator, one Skidsteer, one rock drill rig, and one water truck used for dust suppression by watering the roads and work areas. The haul trucks traveling on the unpaved access road to the quarry and in the quarry area where the trucks are loaded and weighed also generate fugitive dust. Dust control from these sources is achieved by watering work areas and roadways, and by wetting surge and storage piles to maintain adequate moisture to minimize airborne particulates. Exhaust emissions are also generated by the mobile sources.

Maximum annual average and average daily emissions associated with the above source categories were calculated for baseline quarry operation. Daily emissions were based on the estimated daily production levels of the asphalt processing facility. Maximum annual average emissions were based on a maximum baseline annual

average production of 75,000 cubic yards (156,940 tons per year). In estimating the baseline annual number of haul trucks used, an average truckload capacity of 16 cubic yards (27 tons) of quarry product was assumed. Details of the emission calculations are provided in Appendix D.

Particulate matter emissions from the quarry processing equipment were calculated using quarry and equipment processing rates and the U.S. EPA's AP-42 emission factors for Crushed Stone Processing (AP-42 Section 11.19-2). Exhaust emissions from the on-site quarry mobile equipment were computed using emission factors from the CARB OFFROAD2007 model for off-road diesel engines. The CARB developed these emission factors, which vary by engine horsepower rating and year of engine, for preparing State and local emission inventories of diesel equipment and off-road mobile sources. Emissions of NOx, CO, VOCs, PM10, PM2.5, and carbon dioxide (CO2) were computed using these emission factors, along with the year of equipment, engine horsepower ratings, operating schedule, and equipment load factors. Diesel particulate matter emissions were assumed to be the same as that of the exhaust PM10 emissions. Typical off-road equipment can last many years. Older equipment can produce emissions much higher than newer equipment that must meet current or near-future mandated emission standards. Thus, the age of the equipment was taken into account when estimating emissions.

Exhaust emissions from the haul trucks and employee vehicles were computed using the CARB EMFAC2007 on-road mobile source emissions model. CARB default model inputs for Mendocino County were used. The haul trucks were all assumed to be diesel-fueled heavy, heavy-duty trucks (HHD). For the baseline analysis, emissions for calendar year 2010 were used. Generally, the trucks used by aggregate suppliers in Mendocino County are no older than 15 years (some trucks may be older, but most trucks are newer than 10 years old). Thus, it was assumed that the vehicles in the truck fleet were manufactured in 1993 or later. A vehicle speed of 10 miles per hour was used to generate emission factors for trucks traveling on the access road and within the quarry. When traveling off-site haul trucks and employee vehicles were assumed to travel at average speeds of 55 mph and 60 mph, respectively. Haul truck emission estimates included running exhaust and idle emissions.

In addition to the direct emissions from the quarry equipment and processing activities, indirect emissions from on-road vehicles (haul trucks and employee vehicles) while traveling off-site and within the quarry site were calculated and included in the emissions inventory.

A summary of the estimated daily and annual quarry baseline emissions of CO, NOx, VOC, PM10, PM2.5, and CO_2 are provided in Tables 4.6-5 and 4.6-6, respectively. Details of the emissions calculations are provided in Appendix D.

Table 4.6-5
Summary of Harris Quarry Baseline Daily Emissions

	Daily Emissions (lb/day)					
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**CO2**
Diesel Generators	114.0	37.6	6.5	0.7	0.7	17,084
Processing Equipment	-	-	-	7.7	0.7	-
Quarrying/Fugitives	-	-	-	17.1	3.8	-
Off-Road Equipment Exhaust	121.0	26.8	8.7	4.0	4.0	10,444
Truck Travel on Haul Road[a]	-	-	-	7.2	0.7	-
Quarry Subtotal	235.0	64.4	15.2	36.6	9.8	27,528
Indirect Emissions[b]						
Truck and Employee Vehicles	61.1	16.8	3.1	2.2	1.9	439
Total (Direct + Indirect)	**296.1**	**81.2**	**18.3**	**38.8**	**11.7**	**27,967**

[a] Fugitive dust emissions from haul trucks traveling on access road and in the quarry area.

[b] Indirect emissions are those associated with vehicles (trucks and employee vehicles) not permanently located at the site.

Table 4.6-6
Summary of Harris Quarry Baseline Annual Emissions

	Annual Emissions (ton/year)					
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**CO2**
Diesel Generators	8.0	2.6	0.5	0.05	0.05	1,196
Processing Equipment	-	-	-	0.5	0.02	-
Quarrying/Fugitives	-	-	-	1.1	0.2	-
Off-Road Equipment Exhaust	8.5	1.9	0.6	0.3	0.3	731
Truck Travel on Haul Road[a]	-	-	-	0.5	0.05	-
Quarry Subtotal	*16.5*	*4.5*	*1.1*	*2.4*	*2.3*	*1,927*
Indirect Emissions[b]						
Truck and Employee Vehicles	5.4	1.5	0.3	0.2	0.6	706
Total (Direct + Indirect)	**21.9**	**6.0**	**1.4**	**2.6**	**2.9**	**2,633**

[a] Fugitive dust emissions from haul trucks traveling on access road and in the quarry area.

[b] Indirect emissions are those associated with vehicles (trucks and employee vehicles) not permanently located at the site.

5. Sensitive Receptors

Sensitive receptors are locations where an identifiable subset of the general population (children, asthmatics, the elderly, and the acutely or chronically ill) that is at greater risk than the general population to the effects of air pollutants are likely to be exposed. These locations include residential areas, schools, retirement homes, convalescent homes, hospitals, and medical clinics.

The area immediately surrounding the Harris Quarry is comprised of undeveloped lands. There are no sensitive receptors immediately adjacent to the quarry. To the west of the

quarry is undeveloped land owned by the applicant. Further west and southwest there is rural residential development. The nearest residence to the west is about 1.4 miles west of the quarry. The nearest residence to the asphalt plant site is about one mile to the west. To the south is undeveloped open space on the Ridgewood Ranch belonging to the Church of the Golden Rule. The Church's compound (off Ridgewood Road) is located about two miles south of the quarry. La Vita School is located about 2.3 miles south of the quarry. A mobile home park (Golden Rule Mobile Village) is located about 3 miles south of the quarry. Five to six residential units and several former commercial businesses including a motel, service station, and restaurant are located to the north of the quarry site, along Highway 101, and northeast of the asphalt plant site. This development is as near as 1,000 feet of the asphalt plant site. North of the asphalt plant site (and west of the highway commercial area) is open space land owned by the applicant. Across the highway and about 3,000 feet northeast of the asphalt plant site is the California Department of Forestry Howard Forest Fire Station. Further north and northwest are rural residential properties; the property boundary of the nearest rural residential property is about 3,000 feet north of the asphalt plant site, with the nearest home located approximately one mile away.

6. Greenhouse Gas Emissions and Global Climate Change

Climate change is caused by greenhouse gases (GHGs) emitted into the atmosphere around the world from a variety of sources, including the combustion of fuel for energy and transportation, cement manufacturing, and refrigerant emissions. GHGs are those gases that have the ability to trap heat in the atmosphere, a process that is analogous to the way a greenhouse traps heat. GHGs may be emitted as a result of human activities, as well as through natural processes. GHGs have been accumulating in the earth's atmosphere at a faster rate than has occurred historically. Increasing GHG concentrations in the atmosphere are leading to global climate change.

Carbon dioxide (CO2) is the most important anthropogenic GHG because it comprises the majority of total GHG emissions emitted per year and it is very long-lived in the atmosphere. Common GHGs include carbon dioxide, methane, nitrous oxides, and halocarbons (a group of gases containing fluorine, chlorine, or bromine). Typically, when evaluating GHG emissions they are expressed as carbon dioxide equivalents, or CO2e, which is a means of weighting the global warming potential (GWP) of the different gases relative to the global warming effect of CO2, which has a GWP value of one. Other GHGs, such as methane and nitrous oxide which are commonly found in the atmosphere, but at much lower concentrations, have a GWP of 21 and 310, respectively. In the United States, CO_2 emissions account for about 85 percent of the CO2e emissions, followed by methane at about eight percent and nitrous oxide at about five percent.

Current Regulatory Setting

Federal

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC). While the United States signed the Kyoto Protocol, which would have required reductions in GHGs, Congress never ratified the protocol. The Federal

government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. In 2002, the U.S. announced a strategy to reduce the greenhouse gas intensity of the American economy by 18 percent over the 10-year period from 2002 to 2012.

In 2007, the EPA identified CO2 as an air pollutant as defined under the Clean Air Act, and the EPA determined it has the authority to regulate emissions of GHGs. In 2009, the EPA published their "Proposed Endangerment and Cause or Contribution Findings for Greenhouse Gases under the CAA". This finding is based on the Federal Clean Air Act, which states that the EPA Administrator should regulate and develop standards for emissions of air pollution from any class or classes of new motor vehicles or new motor vehicle engines, which in its judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.

Since the EPA's endangerment finding, the EPA has promulgated several GHG regulations, which for the most part, apply to larger facilities that emit large amounts of CO2 or its equivalent in other regulated GHGs. These regulations include the Federal Mandatory Reporting of Greenhouse Gases (Mandatory Reporting Rule) and the Tailoring Rule. In 2009 the EPA established the Mandatory Reporting Rule, which requires reporting of CO2 and other GHG emissions. This rule applies to particular facility types, some of which are required to report based on the quantity of GHGs that they emit, while others are required to report regardless of the quantity of their GHG emissions. Stationary fuel combustion sources are subject to the rule if the aggregate maximum heat input capacity of all units is 30 million British thermal units per hour (MMBtu/hr) or more and the combined GHG emissions equals 25,000 metric tons of CO2e or more per year.

In May 2010, the EPA issued a final rule that addressed greenhouse gas emissions from stationary sources and requirements under Title V and PSD permitting programs. This rule is known as the PSD and Title V Greenhouse Gas Tailoring Rule, or Tailoring Rule. After July 1, 2011, new sources with GHG emissions of at least 100,000 tons per year will be subject to PSD permitting requirements. Additionally, new and existing sources with GHG emissions of at least 100,000 tons per year will be subject to Title V permitting requirements.

The Harris Quarry is not a major source under the PSD or Title V permit regulations, and it will not become a major source with the proposed increase in quarry production levels and the addition of the asphalt facility; it will not be subject to the Tailoring Rule. Although the proposed asphalt plant will have equipment with a maximum combined heat input of 30 MMBtu/hr, its CO2e emissions will be less than 25,000 tons of CO2e per year, and therefore, not subject to the Mandatory Reporting Rule.

State

In response to the increasing body of evidence that GHGs will continue to affect the global climate, the State has enacted key legislation and implemented regulations in an effort to reduce the State's contribution to climate change.

California Assembly Bill 1493 (Pavley) enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce GHG emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB apply to 2009 and later model year vehicles. CARB estimates that the regulation will reduce climate change emissions from light duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels. The California Climate Action Team's (CAT) Report to the Governor contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG in California. GHG as defined under AB 32 include: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 requires the California Air Resources Board, the State agency charged with regulating statewide air quality, to adopt rules and regulations that would achieve greenhouse gas emissions equivalent to statewide levels in 1990 by 2020. CARB approved the Climate Change Scoping Plan (Scoping Plan) in December 2008. The Scoping Plan outlines actions to obtain the goal set out in AB 32 of reducing emissions to 1990 levels by 2020. The Scoping Plan "proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health". The measures in the Scoping Plan will be in place by 2012. The Scoping Plan's recommendations for reducing greenhouse gas emissions to 1990 levels by 2020 provide for emission reduction measures, including a cap-and-trade program linked to Western Climate Initiative partner jurisdictions, green building strategies, recycling and waste-related measures, and Voluntary Early Actions and Reductions. CARB has also developed and approved a 1990 State GHG emissions inventory of 427 million metric tons of carbon dioxide equivalent (MMTCO2e) in December 2007. Therefore, in 2020, GHG emissions in California are required to be at or below 427 MMTCO2e.

Executive Order S-01-07 was enacted by the Governor on January 18, 2007. The order mandates a two pronged approach to achieving lower fuel emissions. First, it states that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020, then from that baseline a Low Carbon Fuel Standard for transportation fuels shall be established for California.

California Senate Bill 97 (SB-97), signed by the governor in August 2007, acknowledges climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Governor's Office of Planning and Research to prepare, develop, and transmit to the California Resources Agency by July 1, 2009 guidelines for mitigating GHG emissions or the effects of GHG emissions, as required by CEQA. The California Resources Agency was required to certify and adopt these guidelines by January 1, 2010. Amendments to the CEQA Guidelines pursuant to BB-97 were adopted in March 2010.

California Senate Bill 375 passed on August 30, 2008 and was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of greenhouse gas emissions, which emits over 40 percent of the total greenhouse gas emissions in California. SB 375 states that "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing greenhouse gas emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

In January 2010, the State Building Standards Commission adopted the State Green Building Standards Code (CALGreen). CALGreen supplements the California Building Standards Code (Title 24) which became effective on January 1, 2011 requiring all new buildings in the state to incorporate energy saving features. New standards include:

- Water efficiency: New buildings must demonstrate at least a 20 percent reduction in water use over typical baseline conditions.
- Construction waste: At least 50 percent of construction waste must be recycled, reused, or otherwise diverted from landfilling.
- Interior finishes: Interior finishes such as paints, carpet, vinyl flooring, particle board, and other similar materials must be low-pollutant emitting.
- Landscape irrigation: In nonresidential buildings, separate water meters must be provided for a building's indoor and outdoor water use. Large landscape projects must use moisture-sensing irrigation systems to limit unnecessary watering.

Baseline Quarry Operation GHG Emissions

GHG emissions from current operations at the Harris Quarry are entirely due to combustion of fossil fuel (primarily diesel) in the generators used for powering the quarry and for running pumps and other equipment, and in running the off-road mobile equipment. GHG emissions are also produced by the vehicles accessing the quarry (haul trucks and employee vehicles). GHG emissions from baseline quarry operation in 2010 were estimated for above emissions sources using the same methods described earlier for estimating baseline criteria pollutant emissions from the quarry. The baseline GHG emissions are summarized in Table 4.6-7.

Table 4.6-7
Summary of Harris Quarry Baseline Greenhouse Gas Emissions

	Greenhouse Gas Emissions	
Emission Source	**(short tons/year)[a]**	**(metric tons/year)**
Diesel Generators	1,196	1,085
Off-Road Equipment Exhaust	731	663
Quarry Subtotal	1,927	1,748
Indirect Emissions		
On-road Truck Exhaust	663	601
Employee Vehicles	43	39
Indirect Subtotal	*706*	*640*
Total	**2,633**	**2,388**

[a] A short ton is the standard ton in the U.S. (1 short ton = 2,000 lbs)

Methods of Assessing Global Climate Change

Amendments to the CEQA Guidelines, pursuant to SB-97 include a new section 15064.4 designed to assist lead agencies in determining the significance of the impacts of GHG emissions. Section 15064.4 encourages lead agencies to quantify the greenhouse gas emissions of proposed projects where possible and recommends lead agencies consider several factors in determining significance: (1) the extent to which the project may increase or reduce GHG emissions compared with the existing environment, (2) whether the emissions exceed a threshold of significance that applies to the project, and (3) the extent to which the project complies with requirements adopted to implement statewide, regional, or local plans for reduction of GHG emissions.

There is currently no County Greenhouse Plan for reduction of emissions that can be used in assessing project impacts. However, the MCAQMD has recommended GHG significance thresholds[102]. For stationary source projects, the MCAQMD significance threshold is 10,000 metric tons per year of CO2e. For projects other than stationary sources, such as land-development projects, the GHG significance threshold is 1,100 metric tons per year of CO2e or 4.6 metric tons of CO2e per service population (residents and employees) per year.

For this EIR, GHG emissions are quantified for both the existing quarry and the proposed project and the net increase in GHG emissions due to the proposed project are compared to the stationary source GHG significance threshold.

B. Potential Impacts and Mitigation Measures

1. Criteria for Determining Impact Significance

According to Appendix G of the CEQA Guidelines, a project would have a significant effect on air quality if it:

4.6a Conflicts with or obstructs implementation of the applicable air quality plan.

4.6b Violates any ambient air quality standard or contributes substantially to an existing or projected air quality violation.

4.6c Results in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

4.6d Exposes sensitive receptors to substantial pollutant concentrations.

4.6e Creates objectionable odors affecting a substantial number of people.

[102] Memorandum from Christopher D. Brown AICP, Air Pollution Control Officer to Planning Agencies and Planning Consultants, October 7, 2010, *Clarification of Interim CEQA Criteria and GHG Pollutant Thresholds*.

For Greenhouse Gas Emissions, a project would have a significant effect if it would:

4.6f Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

4.6g Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Appendix G provides that, when available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon for determinations of significance. The MCAQMD, in 2010, established recommended significance criteria for evaluating CEQA projects[103]. The MCAQMD's recommended significance thresholds are provided for indirect and stationary (direct) operational emissions, where the indirect thresholds are used for indirect emissions from vehicle trips associated with a project. Table 4.6-8 summarizes the recommended emission thresholds. Projects with emissions that exceed these thresholds would be considered to have a significant air quality impact.

Table 4.6-8
MCAQMD Significant Impact Thresholds

	Indirect Source	**Project/Stationary Source**
Criteria Pollutant and Precursors	**Average Daily Emissions (lb/day)**	**Maximum Annual Emissions (tons/year)**
ROG	180	40
NOx	42	40
PM10	82	15
PM2.5	54	10
Fugitive Dust (PM10/PM2.5)	same as above	
Local CO[a]	125 tons/year	
Greenhouse Gas Emissions	**Projects Other than Stationary Sources**	**Stationary Sources**
GHGs	1,100 MT of CO2e/year	10,000 MT of CO2e/year

Notes: MT = metric tons, CO2e = CO2 equivalents

[a] MCAQMD's indirect permitting rules allow 125 ton/year of CO. Local hot spots of CO resulting from traffic congestion must still be accounted for using a health based screening level approach.

It should be noted that previously the MCAQMD used both emission-based and concentration-based significance thresholds. In order to assess impacts for pollutants with concentration-based significance thresholds, air quality dispersion modeling was needed to predict project-related concentration increases for comparison with the thresholds. The current MCAQMD-recommended CEQA significance thresholds for criteria pollutants are emission-based thresholds, except for CO which still requires a local CO hot spot analysis in addition to an emission-based threshold.

[103] http://www.co.mendocino.ca.us/aqmd/CEQA2010.htm

The pollutants of most concern for the proposed project are particulate matter (PM10 and PM2.5) in addition to carbon monoxide and ozone (including ozone precursor pollutants, VOCs and NOx). For the purpose of this assessment, emissions of CO, NOx, VOCs, PM10 and PM2.5 were assessed and a CO hot spots evaluation performed. The impacts from SO_2 emissions are anticipated to be minor because: (1) background concentrations are well below ambient air quality standards, and (2) due to the use of ultra low sulfur fuel for the project, SO_2 emissions are expected to be negligible.

Toxic Air Contaminants

The operation of any project with the potential to expose sensitive receptors to substantial levels of TACs would have a potentially significant impact. Proposed projects that have the potential for exposure to TACs that would result in health effects in excess of the following MCAQMD-recommended CEQA thresholds should be considered to have a significant impact.

- An increase in cancer risk of greater than 10.0 cases in a million people
- An increase in the exposure to non-carcinogenic TACs that would result in a Hazard Index (Chronic or Acute) of greater than 1.0

Non-cancer health risk is usually determined by comparing the predicted level of exposure to a chemical to the level of exposure that is not expected to cause any adverse effects (reference exposure level), even to the most susceptible people. This ratio of predicted exposure level to the reference exposure level is called the Hazard Index (this value represents the maximum concentration at which no adverse health effects to the respiratory system are anticipated to occur),

These thresholds are typically evaluated based on the results of a health risk assessment utilizing dispersion modeling to assess TAC concentration increases from a project.

2. Project Impacts

The focus of the air quality impact analysis is to evaluate whether there would be a substantial increase in criteria pollutant emissions from the proposed project above baseline emission levels, and if so, whether the increased emissions are likely to result in a significant air quality impact, and whether the proposed project would result in significant increases in adverse health effects at sensitive receptor locations in the project area. The primary pollutant of concern associated with the proposed project (quarry expansion and asphalt plant) is particulate matter (PM10 and PM2.5) generated during excavation and quarry processing operations and haul truck travel, Other pollutant emissions from haul trucks, other mobile equipment (e.g., dozers and loaders), and from the production of asphalt are also a concern.

For this analysis, emissions from operation of the existing quarry at the current permitted production level were quantified in order to establish a baseline level of emissions. Emissions from the proposed project (quarry at an increased production level and the

addition of an asphalt plant) were also calculated. Consistent with the timeframes analyzed in the traffic analysis, baseline and project emissions were calculated for the baseline year of 2010 and the future horizon year of 2030. The increase in emissions for the project over the baseline quarry operations was then calculated. This was done for quarry and project operation in 2010 and 2030. The increase in emissions from the project was then compared to MCAQMD significant impact thresholds. Additionally, potential increases in cancer risk and other non-cancer health effects associated with project TAC emissions were assessed. The description of the methodology used to prepare this analysis is included in Appendix D.

Geologic mapping done for the project 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. A geologic evaluation of naturally occurring asbestos at the quarry site was conducted (Blackburn, 2007) and concluded that the potential for naturally occurring asbestos at the quarry is low. Testing of quarry rock most likely to contain asbestos showed no detection of asbestosiform minerals. Therefore, there would be no impact as regards asbestos pollution.

Construction-Related Impacts

Impact 4.6-A Project construction would increase air emissions from equipment operation and fugitive dust from earth-moving activities.

During construction of the asphalt plant, earthmoving vehicles and other diesel and gas-powered construction equipment would generate exhaust emissions of CO, NOx, VOC, and particulate matter. PM10 would also be generated in the form of fugitive dust emissions from earth clearing and grading, and vehicle traffic on unpaved surfaces at the project site and on access roads, thereby resulting in a potentially significant impact. Fugitive dust represents the particles of dust generated and introduced into the atmosphere that do not readily fall back to the ground due to their small size and mass (including PM10).

Exhaust emissions from construction-related equipment and vehicles is expected to be less than the operational emissions of the asphalt plant, so use of operational emissions to evaluate potential impacts represents a worst-case estimate. However, fugitive dust, which is the primary concern for a construction project of this type, may be generated in significant amounts.

The amount of dust generated would be highly variable and is dependent on the size of the area disturbed, amount of activity, soil conditions and meteorological conditions. Although construction activities would be temporary, they would have the potential to cause both nuisance and air quality impacts. PM_{10} is the pollutant of greatest concern associated with dust. If uncontrolled, PM_{10} levels downwind of actively disturbed areas could possibly exceed State standards. If uncontrolled, dust generated by grading and construction activities represents a ***potentially significant impact.*** The MCAQMD does not have a significance threshold for fugitive dust from construction, but specifies the use of Best Management Practices in lieu of a threshold.

Mitigation Measures

4.6-A.1 Implement the measures recommended by MCAQMD under their Rule 430 for Fugitive Dust Emissions as listed below:

1. All visibly dry disturbed soil road surfaces shall be watered to minimize fugitive dust emissions.
2. All unpaved surfaces, unless otherwise treated with suitable chemicals or oils, shall have a posted speed limit of 10 miles per hour**.**
3. Earth or other material that has been transported by trucking or earth moving equipment, erosion by water, or other means onto paved streets shall be promptly removed.
4. Asphalt, oil, water or suitable chemicals shall be applied on materials stockpiles, and other surfaces that can give rise to
5. All earthmoving activities shall cease when sustained winds exceed 15 miles per hour.
6. The operator shall take reasonable precautions to prevent the entry of unauthorized vehicles onto the site during non-work hours.
7. The operator shall keep a daily log of activities to control fugitive dust.

Impact Significance After Mitigation

This mitigation would reduce PM10 impacts to a **less-than-significant** level.

Criteria Pollutant Emissions

Impact 4.6-B The quarry project would generate direct emissions of criteria pollutant emissions (NOx, CO, VOCs, PM10, and PM2.5) from on-site activities during operation of the quarry and asphalt plant which could exceed applicable significance levels.

The proposed project would result in increased emissions from operation of the expanded quarry and new emissions from operation of the asphalt plant. Direct emissions from project related on-site activities would result from operation of stationary equipment (diesel generators, quarry processing equipment, and asphalt plant production and storage equipment), off-road mobile equipment (exhaust and fugitive dust) at the quarry and asphalt plant, and fugitive dust from haul trucks while at the site. Criteria pollutant emissions would also be produced by haul trucks and other vehicles while traveling to and from the project site. These vehicle emissions are considered indirect emissions by the MCAQMD since they are a result of the project and occur primarily off-site. Impacts from indirect emissions are evaluate separately under Impact 4.6-C.

As described previously, project-related direct criteria pollutant emissions were calculated for the proposed quarry expansion and the new asphalt plant. Average daily emissions, in pounds per day, and maximum annual emissions in tons per year, were used for this analysis, consistent with MCAQMD significance thresholds.

Emission sources at the quarry and their calculation methods are essentially the same as described earlier for the baseline quarry operation emissions. A wash plant will be added to the quarry, but it is expected that emissions from washing would be negligible since the material being processed will be wet. The project does not propose to add any additional off-road mobile equipment for quarry operations and will only add one additional employee for the wash plant. Thus, quarry operations will generally remain the same except they will occur for more days per year, and the project includes the ability for higher hourly production of material through the processing equipment during periods of peak demand. The increased processing rate of the equipment for the project was accounted for in the project emissions estimates.

Emission sources at the quarry include the diesel generators, quarry processing equipment, and off-road mobile equipment. Emissions from the off-road mobile equipment would be from both the equipment exhaust and fugitive dust from their various activities. Fugitive dust would also be generated by haul trucks while traveling on project roads. Fugitive dust from trucks would be minimized by paving all the internal haul roads for the project. Indirect emission sources include vehicle exhaust emissions from trucks and employee vehicles while traveling on and off site.

The asphalt plant will add new emission sources to the project site. The asphalt plant will be capable of producing a maximum of 300 tons per hour of asphalt, and will be limited to a maximum annual asphalt production of 150,000 tons. The asphalt plant proposed and evaluated in the original EIR had an annual production of 250,000 tons per year. The applicant has reduced the requested maximum allowable annual asphalt production by 100,000 tons per year compared to the original proposed asphalt plant.

Sources at the asphalt plant include an asphalt drum mixer (dryer) with a 75 million British thermal unit per hour (MMBtu/hr) diesel fuel burner, a 1.2 MMBtu/hr diesel-fueled hot oil heater, asphalt oil storage tanks, asphalt silos for product storage, raw material (sand and gravel) storage piles, and a loader for handling the raw materials. Indirect sources include vehicle exhaust emissions from trucks and employee vehicles while traveling on and off site; these indirect emissions are assessed in Impact 4.6-C below.

Particulate matter emissions from the asphalt plant would be reduced by using a pulse jet baghouse with inertial separator. The drum mixer dryer would be equipped with a pulse jet baghouse for particulate control. The baghouse also removes steam and combustion products from the drum mixer dryer. Dust from the drum mixer dryer enters a primary cyclone inertial separator where most of the larger particulates are collected. Dust not collected by the separator can be returned to the process. Larger particles are removed to protect the bags from abrasion. The finer dust is collected by the fabric bags inside the baghouse. The bags are pulsed (cleaned) to remove the collected particulate matter. The fine dust collected in the baghouse hopper can be returned to the process or discarded as waste depending on the mix design.

Additionally, to further reduce particulate matter and VOC emissions, a “blue smoke” control system will be used. The system would include a fiberbed mist collector system to control and minimize blue smoke emissions from load-out and silo-filling activities.

Blue smoke results from heating asphalt cement inside the drum mixer. Some of the organic compounds from the asphalt are volatilized, and once these VOCs cool sufficiently, some condense to form a fine liquid particulate or "blue smoke" plume. In order to remove particles from the exhaust gas, the fiberbed mist collector incorporates temperature reduction to allow particles to condense out of the gas stream, and filters to trap particles through impaction, interception, and Brownian diffusion.

The fiberbed collector system typically consists of three sections: the knock-out, prefilter, and coalescing candle filter sections. In the knock-out section, emissions from the asphalt storage bin and load-out activities are routed through exhaust ducts to the collector inlet chamber, which is maintained at a temperature below 120 degrees Fahrenheit. This is accomplished using a fan to cool the gases and a thermocouple to monitor temperature and trigger fan operation. The temperature decrease allows pollutants to condense out of the exhaust stream, collect at the bottom of the unit, and be discharged through an outlet pipe. The gas stream then passes through a bed of six filters where some particles are collected. Finally, after passing through the prefilters, the gas stream moves underneath a vertical baffle and enters the bottom end of the candle filters. Hydrocarbons are captured on the inside of the filters where the particles coalesce into droplets. The droplets drain to the bottom and are periodically pumped out for disposal.

This type of blue smoke collection and control system is considered to be best available control technology (BACT) for control of emissions from silo loading and load-out into trucks. Typically, in California, this type of emission control device has been required in ozone non-attainment areas where there are strict requirements to control emissions of VOCs, a precursor to ozone formation. They have also been required on facilities where blue smoke has been a particular concern.

Emissions from the asphalt plant were calculated using EPA AP-42 emission factors (Section 11.1 – Hot Mix Asphalt and Section 13.2.4 – Aggregate Handling and Storage Piles). Exhaust emissions from the loader were calculated using emission factors from the CARB OFFROAD2007 model and emissions from on-road vehicles were calculated using emission factors from the CARB EMFAC2007 on-road mobile source emissions model.

Tables 4.6-9 and 4.6-10 show the daily and annual emissions rates, respectively, for the proposed quarry expansion and asphalt plant, along with the total emissions for all operations combined for years 2010 and 2030. Daily and annual emissions from the existing quarry, under current permitted production rates, for the years 2010 and 2030 are summarized in Table 4.6-11.

The project's increase in maximum annual direct emissions from existing quarry operation in 2010 and 2030 are shown in Table 4.6-12. These emissions increases are also compared to the applicable MCAQMD emissions significance thresholds in the table. As shown in the table the increased emissions from the proposed project for both project years 2010 and 2030 are well below the MCAQMD thresholds of significance. Thus, the direct emissions of criteria pollutants from proposed project would have a less-than-significant impact. This conclusion assumes that the equipment to be installed and

operated is as described by the applicant. Otherwise, there could be a ***potentially significant impact***.

Mitigation Measures

4.6-B.1 The applicant shall not emit criteria pollutants beyond the levels described and analyzed in this EIR. The Mendocino County Air Quality Management District (MCAQMD) shall not issue an Authority to Construct and a Permit to Operate if the equipment installed would cause the emission of pollutants that exceed the levels analyzed herein. If the MCAQMD determines that the final list of equipment and/or the proposed hours of operation per day and per year of any of the equipment would exceed the levels assessed in this EIR, then additional CEQA analysis would be required to assess the air quality and health impacts of that final list of equipment and operating hours prior to considering whether to issue the Authority to Construct and a Permit to Operate.

4.6-B.2 MCAQMD will review the final list of equipment and the analysis in this EIR and add any additional equipment or operation mitigations that the District finds are needed to avoid air quality standard exceedances and conform to all District, State, and Federal air quality standards and requirements.

Impact Significance After Mitigation

The mitigation measures ensure that the applicant does not purchase an asphalt plant or other equipment that would have greater emission of pollutants than the equipment assessed in this EIR, or operate this equipment beyond the times assessed in this EIR without additional CEQA review. The mitigation also allows MCAQMD to require any additional mitigation the District finds are needed to protect air quality in the area. While the project will emit pollutants into the air, the amount of pollutants would be acceptable given existing standards, criteria, and regulations. The impact is reduced to a ***less-than-significant*** level.

Table 4.6-9
Daily Emissions From Proposed Project Operations in 2010 and 2030

	2010 Emissions					2030 Emissions				
Proposed Quarry	**Daily Emissions (lb/day)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Diesel Generators	114.1	37.9	6.6	0.7	0.7	112.9	36.8	6.1	0.5	0.5
Processing Equipment	-	-	-	14.2	1.3	-	-	-	14.2	1.3
Quarrying/Fugitive Dust	-	-	-	21.5	4.5	-	-	-	21.5	4.5
Off-Road Equipment Exhaust	121.1	26.8	8.8	4.0	4.0	27.5	20.7	2.9	0.4	0.4
Haul Truck Fugitive Dust	-	-	-	0.7	0.1	-	-	-	0.7	0.1
Quarry Subtotal	235.1	64.7	15.4	41.1	10.6	140.4	57.5	9.0	37.3	6.7
Asphalt Plant	**Daily Emissions (lb/day)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Material Handling	-	-	-	0.3	0.04	-	-	-	0.3	0.04
Mobile Equipment Exhaust	5.9	2.3	0.3	0.2	0.2	0.7	2.4	0.2	0.02	0.02
Asphalt Oil Storage Tanks	-	-	0.06	-	-	-	-	0.06	-	-
Asphalt Plant Dryer	38.5	91.0	22.4	16.1	15.4	38.5	91.0	22.4	16.1	15.4
Hot Oil Heater	4.2	0.3	0.1	0.2	0.2	4.2	0.3	0.1	0.2	0.2
Silo Filling	-	0.8	8.5	0.0004	0.0004	-	0.8	8.5	0.0004	0.0004
Asphalt Silo Loadout	-	0.9	2.9	0.4	0.4	-	0.9	2.9	0.4	0.4
Haul Truck Fugitive Dust	-	-	-	2.0	0.3	-	-	-	2.0	0.3
Asphalt Plant Subtotal	48.6	95.4	34.3	19.2	16.5	43.4	95.5	34.2	18.9	16.3
Total Direct Emissions	***283.7***	***160.1***	***49.7***	***60.3***	***27.1***	***183.8***	***153.0***	***43.2***	***56.2***	***23.0***
Indirect Emissions	**Daily Emissions (lb/day)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
On-Road Truck Exhaust	178.4	35.3	8.8	6.5	5.5	34.7	18.2	2.8	2.3	1.7
Employee Vehicles	1.3	7.0	0.3	0.1	0.04	0.1	0.9	0.2	0.1	0.04
Total Indirect Emissions	***179.7***	***42.4***	***9.1***	***6.5***	***5.5***	***34.8***	***19.2***	***3.0***	***2.4***	***1.8***
Total Emissions (Direct + Indirect)	**463.4**	**202.5**	**58.8**	**66.8**	**32.6**	**175.3**	**76.7**	**12.0**	**39.6**	**8.5**

Table 4.6-10
Maximum Annual Emissions From Proposed Project Operations in 2010 and 2030

	2010 Emissions					2030 Emissions				
Proposed Quarry	**Maximum Annual Emissions (tons/year)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Diesel Generators	9.7	3.2	0.6	0.1	0.1	9.6	3.1	0.5	0.04	0.04
Processing Equipment				1.2	0.1				1.2	0.1
Quarrying/Fugitive Dust				2.0	0.4				2.0	0.4
Off-Road Equipment Exhaust	10.3	2.3	0.7	0.3	0.3	2.3	1.8	0.2	0.03	0.03
Haul Truck Fugitive Dust				0.1	0.0				0.06	0.01
Quarry Subtotal	20.0	5.5	1.3	3.7	0.9	11.9	4.9	0.8	3.4	0.6
Proposed Asphalt Plant	**Maximum Annual Emissions (tons/year)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Material Handling				0.03	0.004				0.03	0.004
Mobile Equipment Exhaust	0.4	0.2	0.02	0.02	0.02	0.05	0.2	0.02	0.002	0.002
Asphalt Oil Storage Tanks	-	-	0.02	-	-	-	-	0.02	-	-
Asphalt Plant Dryer	4.1	9.8	2.4	0.3	0.2	4.1	9.8	2.4	0.3	0.2
Hot Oil Heater	0.8	0.05	0.02	0.04	0.03	0.8	0.05	0.02	0.04	0.03
Silo Filling	-	0.1	0.9	0.00	0.00	-	0.1	0.9	0.00	0.00
Asphalt Silo Loadout	-	0.1	0.3	0.04	0.04	-	0.1	0.3	0.04	0.04
Haul Truck Fugitive Dust				0.1	0.01				0.06	0.01
Asphalt Plant Subtotal	5.3	10.1	3.7	0.5	0.3	4.9	10.2	3.7	0.5	0.3
Total Direct Emissions	***25.3***	***15.7***	***5.0***	***4.2***	***1.3***	***16.9***	***15.0***	***4.4***	***3.8***	***0.9***
Indirect Emissions	**Maximum Annual Emissions (tons/year)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
On-Road Truck Exhaust	14.8	2.9	0.7	0.5	0.5	2.9	1.5	0.2	0.2	0.1
Employee Vehicles	0.1	0.6	0.02	0.01	0.003	0.0	0.1	0.01	0.01	0.003
Total Indirect Emissions	***14.9***	***3.5***	***0.8***	***0.5***	***0.5***	***2.9***	***1.6***	***0.2***	***0.2***	***0.1***
Total Emissions (Direct + Indirect)	**40.2**	**19.2**	**5.8**	**4.7**	**1.7**	**19.8**	**16.6**	**4.7**	**4.0**	**1.1**

Table 4.6-11
Existing Quarry Daily and Maximum Annual Emissions
From Operations in 2010 and 2030

	2010 Emissions					2030 Emissions				
Existing Quarry	**Daily Emissions (lb/day)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Diesel Generators	114.0	37.6	6.5	0.7	0.7	112.9	36.7	6.1	0.5	0.5
Processing Equipment	-	-	-	7.7	0.7	-	-	-	7.7	0.7
Quarrying/Fugitive Dust	-	-	-	17.1	3.8	-	-	-	17.1	3.8
Off-Road Equipment Exhaust	121.0	26.8	8.7	4.0	4.0	27.5	20.6	2.9	0.4	0.4
Haul Truck Fugitive Dust				7.2	0.7				7.2	0.7
Total Direct Emissions	***235.0***	***64.4***	***15.3***	***36.6***	***9.8***	***140.4***	***57.4***	***9.0***	***32.8***	***6.0***
Indirect Emissions	**Daily Emissions (lb/day)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
On-Road Truck Exhaust	60.2	11.6	2.9	2.2	1.8	6.0	11.2	0.9	0.8	0.6
Employee Vehicles	1.0	5.1	0.2	0.05	0.03	0.7	0.1	0.01	0.05	0.03
Total Indirect Emissions	***61.1***	***16.8***	***3.1***	***2.2***	***1.9***	***6.6***	***11.3***	***0.9***	***0.8***	***0.6***
Total Emissions (Direct + Indirect)	**296.1**	**81.2**	**18.3**	**38.9**	**11.7**	**147.0**	**68.7**	**9.8**	**33.7**	**6.6**

	2010 Emissions					2030 Emissions				
Existing Quarry	**Maximum Annual Emissions (tons/year)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
Diesel Generators	8.0	2.6	0.5	0.05	0.05	7.9	2.6	0.4	0.03	0.03
Processing Equipment	-	-	-	0.5	0.02	-	-	-	0.5	0.02
Quarrying/Fugitive Dust	-	-	-	1.1	0.2	-	-	-	1.1	0.2
Off-Road Equipment Exhaust	8.5	1.9	0.6	0.3	0.3	1.9	1.4	0.2	0.02	0.02
Haul Truck Fugitive Dust	-	-	-	0.5	0.05	-	-	-	0.5	0.05
Total Direct Emissions	***16.4***	***4.5***	***1.1***	***2.4***	***0.6***	***9.8***	***4.0***	***0.6***	***2.1***	***0.4***
Indirect Emissions	**Maximum Annual Emissions (tons/year)**									
Emission Source	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**	**NOx**	**CO**	**VOC**	**PM10**	**PM2.5**
On-Road Truck Exhaust	5.3	1.0	0.3	0.2	0.2	0.5	1.0	0.1	0.1	0.1
Employee Vehicles	0.1	0.5	0.02	0.004	0.003	0.1	0.007	0.001	0.004	0.003
Total Indirect Emissions	***5.4***	***1.5***	***0.3***	***0.2***	***0.2***	***0.6***	***1.0***	***0.1***	***0.1***	***0.1***
Total Emissions (Direct + Indirect)	**21.8**	**6.0**	**1.3**	**2.6**	**0.8**	**10.4**	**5.0**	**0.7**	**2.2**	**0.4**

Table 4.6-12
Project Maximum Annual Direct Emission (tons/year) Increases in 2010 and 2030 and Comparison to MCAQMD Significance Thresholds

	NOx	CO	VOC	PM10	PM2.5
Proposed Project in 2010					
Proposed Project	25.3	15.7	5.0	4.2	1.3
Existing Quarry at Baseline Production	16.5	4.5	1.1	2.4	0.6
Change in Emissions	**8.8**	**11.2**	**3.9**	**1.8**	**0.7**
Proposed Project in 2030					
Proposed Project	16.9	15.0	4.4	3.8	0.9
Existing Quarry at Baseline Production	9.8	4.0	0.6	2.1	0.4
Change in Emissions	***7.1***	***11.0***	***3.8***	***1.7***	***0.5***
MCAQMD Threshold	***40***	***125***	***40***	***15***	***10***
Significant (Yes or No)?	*No*	*No*	*No*	*No*	*No*

Indirect Emission of Criteria Pollutants

Impact 4.6-C The quarry project would generate indirect emissions of criteria pollutant emissions (NOx, CO, VOCs, PM10, and PM2.5) from on-site activities during operation of the quarry and asphalt plant which could exceed applicable significance levels.

Indirect criteria pollutant emissions would be produced by haul trucks and other vehicles while traveling to and from the propjet site. Emissions from project-related vehicle trips were calculated using the CARB EMFAC2007 on-road emissions model. Vehicle emissions from project operation during 2010 and 2030, as well as from operation of the existing quarry at baseline production levels in 2010 and 2030 were calculated. The emission factors used and resulting emission estimates are shown in Appendix D.

The daily vehicle trips used in calculating indirect emissions were based on the projected truck trip data in Section 4.4 (Traffic) for an average July day. It is expected that these trips will slightly overestimate actual average daily project trips since projected July production rates of aggregate and asphalt are greater than the overall average monthly production rates. Haul trucks were assumed to travel a roundtrip distance of 60 miles, except for the trucks hauling aggregate to the concrete plant in Willits, which were assigned a roundtrip distance of 12 miles. Travel distances for employees and other supply trucks servicing the project were assumed to travel an average roundtrip distance of 22 miles (average of a roundtrip between the project and either Willits or Ukiah). Since most of the off-site vehicle travel would be on Highway 101, truck speeds were assumed to be at an average speed of 55 mph, and employee vehicles were assumed to travel at and average speed of 60 mph. In addition to vehicles traveling off-site, there would be some on-site haul truck travel. Trucks would travel either to the quarry, asphalt plant, or between the quarry and asphalt plant. Emissions from these trucks were calculated based on the estimated travel distances within the site and at an average travel speed of 10 mph.

Average daily indirect vehicle emissions are included in Tables 4.6-9 for the project and Table 4.6-11 for baseline conditions. The project's increase in average daily indirect emissions from existing quarry operation in 2010 and 2030 are shown in Table 4.6-13. These emissions changes are also compared to the applicable MCAQMD emissions significance thresholds in the table.

Table 4.6-13
Project Average Daily Indirect Emission (lb/day) Increases in 2010 and 2030 and Comparison to MCAQMD Significance Thresholds

	NOx	CO	VOC	PM10	PM2.5
Proposed Project in 2010					
Proposed Project	179.7	*42.4*	*9.1*	*6.5*	*5.5*
Existing Quarry at Baseline Production	*61.1*	*16.8*	*3.1*	*2.2*	*1.9*
Change in Emissions	**118.6**	**25.6**	**6.0**	**4.3**	**3.6**
MCAQMD Threshold	***42***	***125***	***180***	***82***	***54***
Significant (Yes or No)?	***Yes***	*No*	*No*	*No*	*No*
Proposed Project in 2030					
Proposed Project	*34.8*	*19.2*	*3.0*	*2.4*	*1.8*
Existing Quarry at Baseline Production	*6.6*	*11.3*	*0.9*	*0.8*	*0.6*
Change in Emissions	***28.2***	***7.9***	***2.1***	***1.6***	***1.2***
MCAQMD Threshold	***42***	***125***	***180***	***82***	***54***
Significant (Yes or No)?	*No*	*No*	*No*	*No*	*No*

Table 4.6-13 shows that the daily MCAQMD threshold for NOx emissions is exceeded for project operation in 2010, but not in 2030. For all other pollutants the project's daily emissions are below the applicable MCAQMD thresholds in both 2010 and 2030. The daily NOx emission increase in 2010 is a ***potentially significant impact***.

For the indirect NOx emissions, 99% of the emissions are from haul trucks associated with the project. NOx emissions from heavy-duty diesel trucks are projected to significantly decrease in the future due to stringent State and Federal engine emission standards that are being applied to new trucks. This is evidenced by the decrease in project NOx emissions from 179.7 lb/day in 2010 to 34.8 lb/day in 2030. NOx emissions will decrease over time as older, higher-emitting trucks are replaced with new trucks meeting current emission standards. Since the project does not own the fleet of haul trucks accessing the site, and specific trucks accessing the site may vary over time, the applicant does not have control over these trucks. As such, implementing mitigation measures to reduce indirect NOx emissions in the near term of the project are not feasible. It is expected that this significant impact would continue for about 6 or 7 years, after which time the average daily NOx emissions will be below the MCAQMD threshold.

Haul truck NOx emissions from the project alone would be significant. However, if one assesses the emissions from the total number of vehicle miles traveled to haul aggregate and asphalt in the County, there would be a decrease in emissions because there is projected to be a net decrease in vehicle miles traveled. As part of the traffic study for the project conducted for the applicant (see Appendix C of this EIR), an analysis of vehicle miles traveled (VMT) with and without the project was prepared; this

study was peer reviewed by the EIR traffic consultant. See the discussion of Traffic for Project Alternative 1 in Section 5.2 of this EIR that provides more detail on this VMT study. The basis of that study is that there is a finite demand for aggregate and asphalt within a geographic area. That demand will be met by hauling aggregate or asphalt from other existing quarries and asphalt plants if the project were not approved. The VMT study examined the demand and supply of aggregate and asphalt within the County, what levels of demand there will be in different areas of the County, where aggregate and asphalt facilities are located relative to the demand locations, and then projected the number and lengths of trips required to satisfy the demand, both with and without the project. Because the project is close to major population centers of the County, aggregate and asphalt trip lengths would be shorter and the total VMT to satisfy countywide demand for these products would be reduced with the project. The project has the potential to decrease the total VMT associated with hauling aggregate and asphalt within Mendocino County by approximately 183,500 VMT annually. This reduction in VMT would result in an overall net reduction in NOx emissions in the County from transportation sources. This VMT analysis is based on several modeling assumptions. It is possible that the actual reductions in VMT could be less (or more) than described here. However, the conclusions of the modeling analysis are clear that there would be at least some reduction in VMT. It is therefore reasonable to conclude that the increased truck traffic generated by the project would at worst replace truck traffic from other facilities and that on a countywide basis there would be no increase in NOx emissions.

Nevertheless, the indirect NOx emissions due to the project alone in 2010 exceed the MCAQMD significance threshold (as that threshold does not account for the regional effect on VMT and NOx emissions), and this is considered a ***significant and unavoidable impact***. The project will not result in any exceedance of any air quality standard, so it is a significant impact only insofar as it exceeds the MCAQMD significance threshold. These emissions could be reduced by reducing the allowable output of the asphalt facility. However, even if the maximum production was reduced by 50% to 75,000 tons per year, this would only reduce the NOx emissions by about 13% (this is because 99% of the emissions are from haul trucks, and only 25% of haul trucks are associated with asphalt delivery). Even with this reduction, the NOx emissions would be well above the MCAQMD significance threshold for NOx for the first 6-7 years of operation - the same as the project. Reducing asphalt production by 50% would be a major change to the project and would be considered a project alternative as opposed to a mitigation. See Section 5.2 (Project Alternatives) for alternatives that reduce allowable production and therefore indirect emissions from hauling vehicles.

Local Carbon Monoxide Pollution

Impact 4.6-D The project-generated on-road traffic could result in the occurrence of carbon monoxide (CO) hot spots that would exceed the California 1-hour and 8-hour CO standards.

The project would result in an increase in the number of trucks and other vehicles visiting the site, thereby potentially increasing congestion at local intersections.

Increased intersection congestion can lead to increased localized CO concentrations (hot spots) in the vicinity of the intersection. Typically there needs to be a substantial increase in the number of vehicles accessing an intersection and a decrease in the intersection level of service (LOS) in order for there to be elevated CO concentrations of concern.

The Bay Area Air Quality Management District (BAAQMD), as part of their new *CEQA Air Quality Guidelines*[104], has developed a preliminary screening methodology which provides a conservative indication of whether a proposed project's CO emissions would cause significant local CO concentration increases. A proposed project would result in less-than-significant impacts to localized concentrations if the following screening criteria are met:

1. The project is consistent with an applicable congestion management program established by the County congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.

2. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.

3. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The Harris Quarry project is not in an area where county or regional congestion management programs or plans are applicable. As described in the Traffic Section (Section 4.4), the traffic volumes with and without the project at affected intersections are far lower than 44,000 vehicles per hour, and there are no affected intersections where vertical and/or horizontal mixing is substantially limited.

Based on the BAAQMD screening criteria, the project would have a ***less-than-significant*** impact on local CO concentrations.

Health Impacts

Impact 4.6-E Emissions of toxic air contaminants from the project could injure the health of workers and residents living in the area.

The project would emit toxic air contaminants (TACs) that can cause health impacts if generated in sufficient quantities over an extended period of time. A human health risk assessment was performed to assess potential impacts and public exposure associated with airborne emissions from the project. Potential health risks from continued operation of the existing quarry and from the proposed project were evaluated.

[104] BAAQMD, CEQA Air Quality Guidelines. June 2010.

Air will be the dominant pathway for public exposure to chemical substances released by the project. Airborne emissions of TACs from the project will consist of organic hydrocarbon compounds emitted from the production, storage, and handling of asphalt. Additionally, the State of California has declared diesel particulate matter (DPM) in diesel exhaust as a carcinogenic TAC, as well as having non-cancer health effects. As such, DPM emissions from the exhaust of the stationary and mobile equipment were included in the risk evaluation. Additionally, DPM emissions from haul trucks traveling on-site and along Highway 101 in the project vicinity were included.

Potential health risks from these emissions will occur almost entirely by direct inhalation. To be conservative, additional exposure pathways were included in the health risk evaluation; however, direct inhalation is considered the most likely exposure pathway. The risk assessment was conducted in accordance with guidance established by the OEHHA and CARB (OEHHA 2003a and 2003b).

Health effects from the project were evaluated for sensitive receptors in the project vicinity. As discussed previously, these sensitive receptors include the residents off of Black Bart Road to the west of the project, the Church of the Golden Rule, residents of the Golden Rule Mobile Village, students and teachers at the La Vida School, the CAL FIRE station, and the former commercial area on Highway 101 near Black Bart Road. Residential exposures to TACs and the resulting potential for increased cancer risks were evaluated at all sensitive receptor locations. For the CAL FIRE station and the former commercial area, workplace exposures were also calculated.

Cancer risk is the probability or chance of contracting cancer over a human life span (assumed to be 70 years). Carcinogens are not assumed to have a threshold below which there would be no human health impact. In other words, any exposure to a carcinogen is assumed to have some probability of causing cancer; the lower the exposure, the lower the cancer risk. Under various State and local regulations, an incremental cancer risk greater than 10 in one million due to a project is considered to be a significant impact on public health. For example, the 10 in one million risk level is used by the Air Toxics Hot Spots (AB 2588) program and California's Proposition 65 as the public notification level for air toxic emissions from existing sources. The MCAQMD also uses the 10 in one million criteria in evaluating the significance of potential increased cancer risk from a project.

Non-cancer health effects can be either acute (short term) or chronic (long term). In determining potential non-cancer health risks (chronic and acute) from air toxics, it is assumed there is a dose of the chemical of concern below which there would be no impact on human health. The air concentration corresponding to this dose is called the Reference Exposure Level (REL). Non-cancer health risks are measured in terms of a hazard index, which is the calculated exposure of each contaminant divided by its REL. Hazard indices for pollutants affecting the same target organ are typically summed with the resulting totals expressed as a total hazard index for each organ system. A hazard index of less than 1.0 is considered to be a less-than-significant health risk. In evaluating non-cancer health effects, the MCAQMD uses a significance threshold 1.0 for the hazard index, with a hazard index of greater than 1.0 being considered as having a significant impact.

Chronic toxicity is defined as adverse health effects from prolonged chemical exposure, caused by chemicals accumulating in the body. Because chemical accumulation to toxic levels typically occurs slowly, symptoms of chronic effects usually do not appear until long after exposure commences. The lowest no-effect chronic exposure level for a non-carcinogenic air toxic is the chronic REL. Below this threshold, the body is capable of eliminating or detoxifying the chemical rapidly enough to prevent its accumulation. The chronic hazard index is calculated as the exposure of each contaminant (annual concentration) divided by its REL.

Acute toxicity is defined as adverse health effects caused by a brief chemical exposure of no more than 24 hours. For most chemicals, the air concentration required to produce acute effects is higher than the level required to produce chronic effects because the duration of exposure is shorter. Maximum one-hour average concentrations are divided by acute RELs to obtain a hazard index for health effects caused by relatively high, short-term exposure to air toxics.

In assessing potential cancer and non-cancer health effects for continued operation of the existing quarry and operation of the proposed project, the CARB's Hotspots Analysis and Reporting Program (HARP) computer program[105] and associated OEHHA health risk evaluation guidance (OEHHA 2003a and 2003b) were used. The HARP model was used to evaluate multi-pathway exposure to toxic substances from the quarry and proposed project. The potential exposure pathways included inhalation, dermal (skin) exposure, soil ingestion, ingestion of homegrown produce, and mother's milk, as appropriate for an individual chemical. Because of the conservatism (over prediction) built into the established risk analysis methodology, the actual risks are expected to be lower than those estimated.

The cancer and non-cancer health risks from the project were estimated by conducting dispersion modeling of the TAC emissions and calculating health risks with the HARP model following OEHHA health risk guidance. Details of the modeling methodology and health risk calculations are contained in Appendix D.

Toxic Air Contaminant Emissions

Sources of TACs from existing and future quarry operation include diesel-fueled off-road mobile equipment, diesel generators, and diesel-fueled haul trucks traveling on and off site. DPM is emitted from all these sources. At the asphalt plant, the drum dryer and hot oil heater would emit DPM since they would combust diesel fuel. Other sources of DPM at the asphalt plant include diesel-fueled mobile equipment and haul trucks. Other TACS, in the form of metals and organic hydrocarbons, will be emitted from the drum dryer, hot oil heater, asphalt oil storage tanks, asphalt storage silos, and from load out of asphalt into trucks.

Table 4.6-14 below lists the metal and organic hydrocarbon TACs and the amounts that the asphalt plant would emit on an hourly and annual basis under maximum hourly and annual production conditions. TAC emissions from asphalt plant were calculated using proposed maximum asphalt production rates (300 tons per hour and 150,000 tons per year) and emission factors from the U.S. EPA's *Compilation of Air Pollutant Emission*

[105] http://www.arb.ca.gov/toxics/harp/harp.htm

Factors (AP-42), Section 11.1 – Hot Mix Asphalt Plants.[106] For source types where AP-42 did not have emission factors, emission factors from the California Air Toxics Emission Factor (CATEF) database (CARB, 2005) for similar equipment were used.

TAC emissions from the asphalt oil storage tanks were estimated using the method recommended in Section 11.1 of AP-42 and the total organic compound (TOC) emissions from two 30,000-gallon storage tanks. TOC emissions from the tanks were estimated with the U.S. EPA's TANKS 4.09d model (EPA, 1999) using the chemical and physical characteristics recommended in AP-42 for asphalt oil and the estimated project oil use. Details on these emission calculations are provided in Appendix D.

DPM exhaust emissions from the on-site mobile equipment at the quarry and asphalt plant were calculated using emission factors from the CARB's OFFROAD2007 emissions model. Haul truck exhaust DPM emissions were calculated using the CARB's on-road emissions model EMFACC2007. DPM emissions were calculated for the baseline year of 2010 and future operational year 2030. Details of these emission calculations are provided in Appendix D.

Due to implementation of more stringent emission standards for diesel-fueled off-road and on-road mobile sources, and use of ultra low sulfur diesel fuel, emissions of DPM will be continually decreasing over the next 25 years. Thus, DPM emissions from these sources are dynamic and will be changing over the life of the project. In order to incorporate the effects of the changing DPM emissions over time, time-weighted emission rates were calculated for 30-year and 70-year exposure periods based on calculated DPM emissions for 2010, 2020, and 2030. Table 4.6-15 shows the annual time-weighted DPM emissions from the existing quarry if it were to continue operations at the current permitted production level over the next 30 years and 70 years and from the proposed project, also for operation over the next 30 and 70 years.

After calculating emissions from on-site and off-site TAC emissions sources, the assessment identified sensitive receptors in the project area and modeled TAC concentrations at those receptors. The sensitive receptors include residences to the west, south and north and the CAL FIRE offices. These receptor locations are shown on Figure 4.6-1.

The health risk evaluation for project-related health risks is based on the assumption that the emission controls proposed for the project would be implemented and reflects operation at maximum annual production rates that would occur for each year of project operation. As part of the MCAQMD review and permitting process for the proposed project, the proposed emission controls will be reviewed to identify if they comply with regulatory requirements. Additional emission controls or conditions of operation that further reduce project emissions may be required by the MCAQMD.

[106] http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s01.pdf

Table 4.6-14
Summary of Toxic Air Contaminant Emissions[1]
from the Asphalt Plant

Chemical	Plant Wide Emissions	
	Pounds/Hour	Pounds/Year
Antimony	5.40E-05	2.70E-02
Arsenic	1.68E-04	8.40E-02
Beryllium	1.64E-04	8.18E-02
Cadmium	1.23E-04	6.15E-02
Chromium (Hexavalent)	1.35E-04	6.75E-02
Copper	9.30E-04	4.65E-01
Lead	4.50E-03	2.25E+00
Manganese	2.31E-03	1.16E+00
Mercury	7.80E-04	3.90E-01
Nickel	1.89E-02	9.45E+00
Selenium	1.05E-04	5.25E-02
Zinc	1.83E-02	9.15E+00
Benzo(a)anthracene	7.16E-05	3.58E-02
Benzo(a)pyrene	3.73E-06	1.86E-03
Benzo(b)fluoranthene	3.35E-05	2.40E-02
Benzo(g,h,i)perylene	1.27E-05	6.33E-03
Benzo(k)fluoranthene	1.31E-05	6.53E-03
Chrysene	9.73E-05	4.86E-02
Dibenz(a,h)anthracene	6.55E-07	3.27E-04
Indeno(1,2,3-cd)pyrene	2.26E-06	1.13E-03
Naphthalene	1.96E-01	9.91E+01
Phenol	4.04E-04	2.02E-01
Benzene	1.17E-01	5.86E+01
Bromomethane	4.93E-05	2.61E-02
2-Butanone	2.77E-04	1.50E-01
Carbon Disulfide	8.42E-05	4.68E-02
Chloroethane	8.33E-06	5.34E-03
Chloromethane	1.06E-04	5.95E-02
Ethylbenzene	7.32E-02	6.32E-01
Formaldehyde	9.32E-01	4.66E+02
n-Hexane	8.13E-04	4.36E-01
Methyl Chloroform	1.44E-02	7.20E+00
Styrene	4.06E-05	2.19E-02
Tetrachloroethene	3.22E-05	1.61E-02
Toluene	8.71E-01	4.36E+02
Trichlorotrifluoromethane	5.43E-06	2.72E-03
Xylenes	6.25E-02	3.13E+01
Dioxins	1.75E-09	1.53E-05
Furans	2.01E-09	1.76E-05

Note: Values are expressed in scientific notation (X.XXE+XX) (e.g., 1.25E-02 is 0.0125).

[1] Does not include diesel particulate matter

Figure 4.6-1
Project Site and Sensitive Receptor Locations

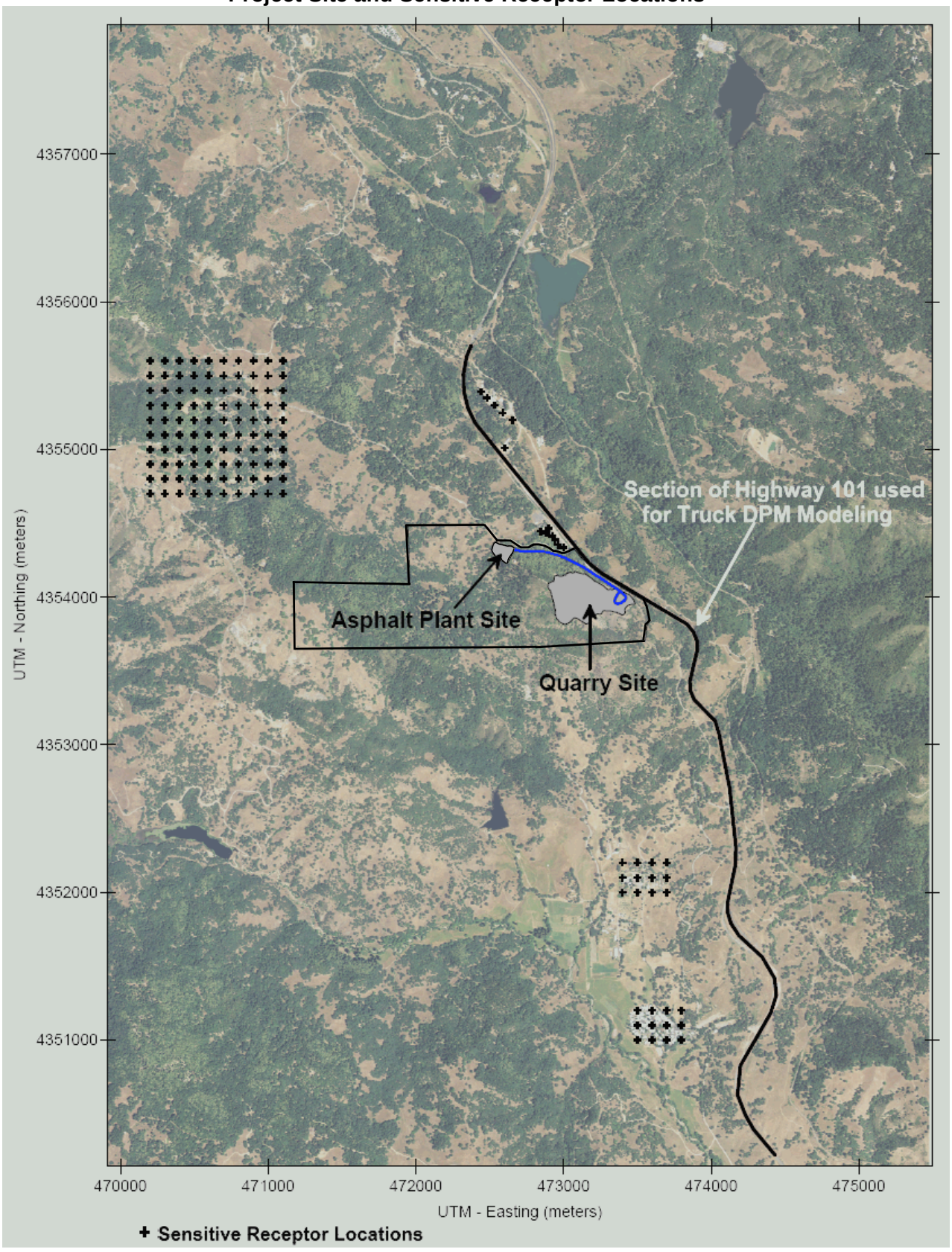


Table 4.6-15
Summary of Diesel Particulate Matter Emissions from Continued Operation of Existing Quarry and the Proposed Project

Emission Source	30-Year Average (lb/year)	70-Year Average (lb/year
Existing Quarry Operation		
Generators	83.3	75.7
Mobile Equipment	273.3	130.3
Haul Trucks	70.5	47.1
Proposed Project		
Generators	102.7	92.3
Mobile Equipment	317.5	172.5
Haul Trucks	170.8	112.2
Drum Dryer	296.0	296.0
Hot Oil Heater	83.0	83.0

Cancer Risk

Health risks from operation of the proposed project, as well as from continued operation of the existing quarry without the proposed project were assessed using the HARP model. Two scenarios were evaluated, one where the operations at the site would cease after 30 years, and the other assuming continued operation for an indefinite period of time. The 30-year period was evaluated because the applicant is not proposing any mining activities beyond the 30 years requested in the Use Permit Application and has volunteered to rezone the project site to Rangeland at the end of the 30 years.

Exposure pathways evaluated in the health risk assessment included inhalation, dermal (skin) exposure, soil ingestion, ingestion of homegrown produce, and mother's milk, as appropriate for each chemical emitted. The cancer risk calculations for residential exposures assumed that a person is exposed to project TACs for 24 hours per day, 350 days per year, over either a 30-year or 70-year period. The cancer risk calculations for workplace exposures (e.g., the CAL FIRE offices and the former commercial area adjacent to Highway 101) used an exposure period of 8 hours per day, 245 days per year, over a 40-year period for the 70-year exposure case and 30 years for the 30-year exposure case. The approach used is intended to result in conservative (i.e., health protective) estimates of health impacts and follows OEHHA risk evaluation procedures. Additional details on the cancer risk calculations are provided in Appendix D.

Table 4.6-16 provides the maximum residential and workplace cancer risks resulting from continued operation of the existing quarry, the project, and the incremental risk due to the project for 30-year and 70-year exposure periods. The maximum increased residential cancer risk for 30-year project operation is 1.24 per one million, which occurs in the old commercial area adjacent to Highway 101 near Black Bart Drive. Increased residential cancer risks at all other sensitive receptor areas are well below 1 per one million. The maximum increased workplace cancer risk for 30-year project operation is 0.69 per one million, again occurring in the old commercial area along Highway 101. If the project were to continue to operate beyond 30 years, the maximum increased

residential and workplace cancer risks would be 2.54 per million and 0.50 per million, respectively, based on a 70-year exposure duration. Again, these maximum cancer risks would occur in the old commercial area along Highway 101. Cancer risks for all other sensitive receptor locations would be 1 in one million or lower. The maximum cancer risks shown in Table 4.6-16 are less than the MCAQMD significance threshold of 10 in one million for cancer impacts.

Table 4.6-16
Summary of Maximum Cancer Risks (per million)
due to Existing and Proposed Project Operations
for 30 and 70 Years of Continued Operation

Receptor	Existing Quarry Maximum Cancer Risk	Proposed Project Maximum Cancer Risk	Increased Cancer Risk
30-year Operation			
Residential Risk			
Black Bart Residents	0.15	0.46	***0.24***
Church of the Golden Rule	0.10	0.17	***0.02***
Golden Rule Mobile Village	0.10	0.19	***0.04***
CAL FIRE Office	0.31	0.71	***0.27***
Old Commercial Area	1.79	3.03	***1.24***
Worker Risk			
CAL FIRE Office	0.16	0.38	***0.22***
Old Commercial Area	0.92	1.61	***0.69***
70-year Operation			
Residential Risk			
Black Bart Residents	0.25	1.25	***1.0***
Church of the Golden Rule	0.17	0.31	***0.14***
Golden Rule Mobile Village	0.18	0.35	***0.17***
CAL FIRE Office	0.51	1.36	***0.85***
Old Commercial Area	2.75	5.29	***2.54***
Worker Risk			
CAL FIRE Office	0.10	0.27	***0.17***
Old Commercial Area	0.54	1.04	***0.50***

Note: MCAQMD cancer risk significance threshold is an increased cancer risk of 10 in one million. Cancer risks greater than 10 in one million are considered significant.

Table 4.6-16 shows that if there were one million people living west of the project site (though this is not physically possible), and they were all exposed to emissions from the project for 30 years at the location of maximum concentration, there would be less than a 25 percent chance of one additional cancer case that would be caused by the project (i.e., 0.24 per 1,000,000 people); this equates to 0.00024 new cancer cases per 1,000 people. The greatest risk would be for people renting units at the old motel/restaurant location on the west side of Highway 101. These residents, if exposed for 30 years, would have 1.24 new cancer cases per 1,000,000 people or 0.00125 new cases per 1,000 people after 30 years of exposure. The project emissions result in risks that are well below the thresholds of significance. If the project were to continue to operate beyond 30 years the likelihood of cancer risks occurring increases due to the increased

exposure duration. However, the increased risks for project operating for 70 years are still below the levels considered significant by the MCAQMD.

This assessment is a worst case analysis due to the health conservative nature of the cancer risk analysis and because the project activity levels (e.g., number of truck trips and processing rates) used in this assessment represent the current best estimate of the peak production rates anticipated over the life of the project; the actual levels will be lower for many years as the operations expand and may never be achieved. Accordingly, the actual health impacts over the length of the project are expected to be less than those presented in this assessment.

Non-Cancer Impacts

In addition to evaluating potential cancer risks, acute (i.e., short-term) and chronic (i.e., long-term) non-cancer health impacts were assessed. Non-cancer health effects can result from exposure to organic and metal compounds emitted from the asphalt production process, DPM, and from crystalline silica in the dust generated during mining and processing. Table 4.6-17 summarizes those acute impacts, and Table 4.6-18 summarizes the chronic impacts, except for crystalline silica which is discussed separately below.

Acute non-cancer health effects are not associated with DPM or crystalline silica, they only have chronic health effects. Since the only TAC emissions associated with the existing quarry are DPM and crystalline silica, the acute hazard index for the existing quarry shown in Table 4.6-17 is zero. Acute impacts would only be associated with emissions from the proposed asphalt plant. Since acute impacts are related to short term exposures, workplace exposures are treated the same as residential exposures.

Table 4.6-17
Summary of Maximum Modeled Acute Non-Cancer Health Impacts from Existing and Proposed Operations

Receptor	Existing Quarry Maximum Acute Hazard Index	Proposed Project Maximum Acute Hazard Index	Change in Acute Hazard Index
Black Bart Residents	0	0.0670	0.0670
Church of the Golden Rule	0	0.0072	0.0072
Golden Rule Mobile Village	0	0.0131	0.0131
CDF Office	0	0.0118	0.0118
Old Commercial Area	0	0.0117	0.0117

Note: MCAQMD significance threshold for the acute non-cancer health effects is a hazard index greater than 1.0.

Maximum short-term TAC concentrations from the project are well below the levels that would cause acute non-cancer health effects. The maximum acute hazard index is more than 10 times lower than MCAQMD significance threshold of 1.0.

Chronic non-cancer health effects are caused by long term exposure to toxic chemicals, resulting in accumulation of these chemicals in the body. The lowest no-effect chronic exposure level for a toxic air contaminant is called the chronic REL. Below this ambient concentration, the body is capable of eliminating or detoxifying the chemical rapidly

enough to prevent its accumulation. The chronic hazard index is calculated as the exposure of each contaminant (annual concentration) divided by its REL. A hazard index of less than 1.0 indicates that the ambient TAC concentrations from a project would not cause chronic non-cancer health effects.

Table 4.6-18 shows the maximum hazard indexes that would occur due to existing quarry operations, the proposed project, and the increase in hazard index from the project for operation over the next 30 and 70 years. The maximum hazard indexes for all operational scenarios and durations are more than 100 times lower than the MCAQMD significance threshold of 1.0. As such, the acute non-cancer health effects from TAC exposure would be less than significant.

Table 4.6-18
Summary of Maximum Modeled Chronic Non-Cancer Health Impacts from Existing and Proposed Operations

Receptor	Existing Quarry Maximum Chronic Hazard Index	Proposed Project Maximum Chronic Hazard Index	Change in Chronic Hazard Index
30 Year Operation			
Residential Exposure			
Black Bart Residents	0.0002	0.0027	0.0025
Church of the Golden Rule	0.0002	0.0004	0.0002
Golden Rule Mobile Village	0.0002	0.0004	0.0002
CDF Office	0.0005	0.0022	0.0017
Old Commercial Area	0.0029	0.0065	0.0036
Worker Exposure			
CDF Office	0.0005	0.0024	0.0019
Old Commercial Area	0.0029	0.0070	0.0041
70 Year Operation			
Residential Exposure			
Black Bart Residents	0.0002	0.0026	0.0024
Church of the Golden Rule	0.0001	0.0003	0.0002
Golden Rule Mobile Village	0.0001	0.0003	0.0002
CDF Office	0.0003	0.0018	0.0015
Old Commercial Area	0.0017	0.0047	0.0030
Worker Exposure			
CDF Office	0.0003	0.0021	0.0018
Old Commercial Area	0.0017	0.0051	0.0034

Note: MCAQMD significance threshold for the chronic hazard index is greater than 1.0

Crystalline Silica Non-Cancer Health Effects

Fugitive dust emissions from quarry operations may contain crystalline silica due to quartz present in the base rock material at the quarry. Based on samples of quarry material obtained and analyzed by the Mine Safety and Health Administration (MSHA) from the Harris Quarry in 2005 and 2006 the crystalline silica content of bulk samples ranged from 4.0% to 7.4%. Crystalline silica has been identified by the OEHHA as a TAC with chronic non-cancer health effects that affect the respiratory system. The chronic inhalation REL for crystalline silica is 3.0 $\mu g/m^3$.

Potential off-site concentrations of crystalline silica were estimated by modeling PM10 emissions from quarry operations at nearby sensitive receptors and conservatively assuming that 10% of the PM10 was crystalline silica. Annual average concentrations of crystalline silica at the maximum exposed residential receptor (located at the old commercial area along Highway 101) were estimated to be approximately 0.027 $\mu g/m^3$. This concentration would result in a chronic hazard index of 0.009. When this value is added to the maximum chronic hazard index of 0.007 for all other TACs (see Table 4.6-18), the total maximum hazard index is 0.016, which is less than the MCAQMD significance threshold of 1.0. As such, the chronic non-cancer health effects from TAC exposure would be less than significant.

The same assumptions were used for assessing these non-cancer impacts as for assessing cancer impacts. Therefore, this is a worst case analysis and actual effects would be expected to be less due to projected diesel emission controls and the fact that it is unlikely that the project would be operating at full capacity every year.

The potential cancer and non-cancer impacts on health would be below thresholds of significance and would therefore be considered less than significant. Nevertheless, because 1) any impact to health has some significance; 2) the modeling assumed that MCAQMD would require emission controls at least as stringent as are proposed for the project; and 3) in the future more may be learned about the health effects of these emissions, particularly cumulative or synergistic effects of exposure to multiple toxic compounds, the impacts on health are considered ***potentially significant.***

Mitigation Measures

4.6-E.1 The applicant shall build and operate the project so that it does not exceed MCAQMD threshold indices for cancer and acute and chronic non-cancer health effects. The applicant shall comply with all MCAQMD requirements all facilities, including for the asphalt facility at least: 1) venting the asphalt storage silos to a Blue Smoke system, and 2) controlling load-out emissions by use of a fiberbed mist collector (part of the Blue Smoke System), unless MCAQMD determines such measures are not required or alternate control measures should be used.

4.6-E.2 The asphalt plant will be a facility that meets at least the emission levels and controls used to assess impacts from that facility in this EIR. If MCAQMD determines that the facility selected for installation would exceed pollutant emission standards as stated in Mitigation Measure 4.6-B.1, then additional risk analysis will be conducted as part of the required additional CEQA review prior to MCAQMD issuing any permits for the project.

Impact Significance After Mitigation

The asphalt plant will be a new type of facility that contains substantive emission controls that exceed the controls in many other asphalt facilities. Requiring the plant to meet MCAQMD requirements further ensures that the plant will not emit pollutants that exceed District standards. The mitigation measures would reduce project emissions below all adopted significance thresholds, and therefore the impact would be reduced to

a ***less-than-significant*** level. However, there will be emission of additional pollutants into the air.

Odors

Impact 4.6-F The asphalt plant would generate odors.

Operation of the asphalt plant, the only major odor source for the proposed project, would emit a number of hydrocarbon compounds that are considered by many people to be objectionable. Emissions of odorous compounds would be reduced by implementation of Best Available Control Technology as required by the MCAQMD. However, odors would still be emitted from the facility even with these controls.

Research has been conducted to determine the minimum concentrations of chemical compounds that people can detect. These minimum concentrations, called odor detection thresholds, are used to determine whether odor compounds emitted from the facility will be smelled. Predicted project concentrations that are greater than its odor threshold are considered significant. Table 4.6-19 shows the concentrations of chemicals associated with the proposed operations at which an odor may be perceived (odor threshold). Because odor sensitivity varies among individuals, using these thresholds provides a forecast of whether objectionable levels of these chemicals might be encountered by the residents and workers in the project area.

An odor analysis was conducted to evaluate the acceptability of potential odor levels in the areas of sensitive receptors by comparing the calculated maximum short-term concentration for individual compounds to their odor thresholds. Air quality dispersion modeling was used to calculate the maximum 1-hour odor compound concentrations in each of the sensitive receptor areas. These maximum 1-hour concentrations were then converted to a 5-minute maximum concentration (the 5-minute concentrations are greater than the 1-hour concentrations) for comparison to the odor thresholds. The resultant concentrations for the chemicals listed in Table 4.6-19 are shown in Table 4.6-20 along with the associated odor thresholds. As indicated in Table 4.6-20, none of the chemical concentrations would exceed the odor thresholds at any of the receptors. Odor modeling results and calculations are provided in Appendix D.

For the asphalt plant, benzene has the highest concentration relative to its odor threshold, and the modeled concentrations are at least 160 times less than the odor threshold. Therefore, the project would create a less-than-significant impact as regards odors, and no mitigation is required so long as the equipment that is installed does not exceed the odor emission levels and controls assessed in this EIR. Otherwise, the project could have a ***potentially significant impact.***

Table 4.6-19
Odor Thresholds

Chemical	Threshold (ppm)
Benzene	1.5
Carbon Disulfide	0.016
Ethyl Benzene	2.3
Ethyl Chloride	4.2
Formaldehyde	0.83
Hexane	130
Methyl Bromide	20.5
Methyl Chloride	10
Methyl Chloroform	120
Methyl Ethyl Ketone	0.1
Naphthalene	0.084
Perchloroethylene	1
Phenol	0.04
Styrene	0.32
Toluene	2.9
Xylene	1.1

Source: U.S. EPA. "Health Effects Notebook for Hazardous Air Pollutants." [Online] [August 17, 2005]. http://epa.gov/ttn/atw/hlthef/hapindex.html

Table 4.6-20
Summary of Odor Results

Chemical	Threshold (ppm)	Modeled 5-Minute Concentration (ppm)				
		Black Bart Residents	Church of the Golden Rule	Golden Rule Mobile Village	Hwy 101 Old Commercial Area	CAL FIRE Office
Benzene	1.5 (1.50E+00)	2.38E-04	2.52E-05	4.58E-05	5.14E-05	4.14E-05
Carbon Disulfide	0.016 (1.60E-02)	1.30E-06	1.83E-07	1.13E-07	4.24E-06	2.50E-07
Ethyl Benzene	2.3 (2.30E+00)	1.18E-04	1.31E-05	2.16E-05	6.43E-05	2.01E-05
Ethyl Chloride	4.2 (4.20E+00)	1.37E-07	1.95E-08	1.24E-08	4.16E-07	2.41E-08
Formaldehyde	0.83 (8.30E-01)	4.91E-03	5.17E-04	9.46E-04	1.02E-03	8.53E-04
Hexane	130 (1.30E+02)	1.14E-05	1.60E-06	9.82E-07	3.76E-05	2.22E-06
Methyl Bromide	20.5 (2.05E+01	6.35E-07	8.84E-08	5.43E-08	2.09E-06	1.24E-07
Methyl Chloride	10 (1.00E+01)	2.42E-06	3.43E-07	2.13E-07	7.90E-06	4.65E-07
Methyl Chloroform	120 (1.20E+02)	1.69E-05	1.77E-06	3.28E-06	3.26E-06	2.95E-06
Methyl Ethyl Ketone	0.1 (1.00E-01)	3.33E-06	4.66E-07	2.87E-07	1.09E-05	6.45E-07
Naphthalene	0.084 (8.40E-02)	2.43E-04	2.58E-05	4.67E-05	5.34E-05	4.22E-05
Perchloroethylene	1 (1.00E+00)	2.48E-07	3.42E-08	2.07E-08	8.24E-07	4.89E-08
Phenol	0.04 (4.00E-02)	5.49E-06	7.56E-07	4.59E-07	1.82E-05	1.08E-06
Styrene	0.32 (3.20E-01)	4.70E-07	6.57E-08	4.04E-08	1.54E-06	9.11E-08
Toluene	2.9 (2.90E+00)	1.49E-03	1.57E-04	2.88E-04	2.98E-04	2.59E-04
Xylene	1.1 (1.10E+00)	1.13E-04	1.33E-05	1.93E-05	1.09E-04	1.98E-05

Note: Values are expressed in scientific notation (X.XXE+XX) (e.g., 1.25E-02 is 0.0125).

Mitigation Measures

4.6-F.1 The asphalt plant shall not result in noxious odors. The plant will be a facility that meets at least the odor emission levels and controls used to assess impacts from that facility in this EIR. If MCAQMD determines that the facility selected for installation would exceed pollutant emission standards as stated in Mitigation Measures 4.6-C.1 and 4.6-E.2, then additional odor analysis will be conducted as part of the required additional CEQA review prior to MCAQMD issuing any permits for the project.

Impact Significance After Mitigation

The mitigation ensures that odors generated by the asphalt facility will be reduced to a ***less-than-significant*** level.

Weather Changes

Impact 4.6-G The quarry project would reduce the elevation of the hill on the site and cause changes to local weather patterns.

Several respondents to the NOP requested that the EIR assess whether mining of the hill on the site would affect local weather patterns. The proposed mining would eventually reduce the elevation of the hill from 2,345 feet to about 2,150 feet. A meteorological consulting firm was engaged by the EIR preparer to assess the impacts of this hill reduction and the mining of the south side of the hill on local weather, and their complete report is included in Appendix D. That report concluded that local weather is dominated by the higher ridges to the east and west of Ridgewood Summit. Winds approaching Ridgewood Summit from the north during periods of convergence are already being channeled by the numerous larger scale terrain features on both sides of the Summit. The removal of the top and southern portions of the hill is not expected to cause any perceived changes in wind direction or wind speed in areas south or north of Ridgewood Summit since the larger scale terrain features around the project site are the predominant wind forcing (controlling) mechanisms in the area. Thus, no impacts to local weather are expected to occur. The change in elevation would not cause any air quality impacts different from those identified in other impact discussions in this section. The impact is ***less-than-significant***, and no mitigation would be required.

3. Cumulative Impacts

Greenhouse Gases and Global Climate Change

Impact 4.6-H The proposed project could result in greenhouse emissions, either directly or indirectly, that may have a significant impact on the environment.

The proposed project would result in direct and indirect emissions of GHGs. Direct emissions of GHGs refer to GHGs that are emitted directly as a result of project operation and are primarily due to fuel combustion emissions at the site. Indirect

emissions are those emissions that the project will enable, but that are not controlled by project proponent. Examples of indirect emission sources include vehicles traveling to and from the project site, and from off-site generation of electricity used by the project.

Currently, electricity is produced at the quarry by use of a large generator. The continued mining of the quarry will rely on the large generator until such time as PG&E-supplied electricity is extended to the site. Even when electricity is extended to the quarry, the generator would be used at times when more power is needed than can be supplied by the PG&E grid. For purposes of calculating project GHG emissions, it was assumed that the quarry would continue to be served by the large generator. The generator uses diesel fuel thereby generating GHGs.

The proposed asphalt plant will operate on electricity supplied by PG&E. Electricity is used to operate mechanical components (equipment drive motors and blowers for air pollution control equipment) and for other normal on-site energy demands. Since natural gas is not available at the site, the burner for the asphalt drum mixer will be fired with diesel fuel, as well as the hot oil heater. Producing asphalt will require burning substantial quantities of diesel fuel (up to 547 gallons per hour when the plant is operating at peak output).

The proposed quarry and asphalt plant will require the use of heavy equipment and large transport trucks. This equipment will use diesel fuel which when burned will produce carbon dioxide which is a greenhouse gas. Diesel-powered haul trucks will haul aggregate from the quarry to the asphalt plant, and asphalt and aggregate from the site to end users along the Highway 101 corridor.

The largest source of GHG emissions is from fuel combustion by heavy equipment, motor vehicles, and the asphalt production. The primary GHG produced from the combustion of fuel is CO2, while other GHGs, methane and nitrous oxide, are produced, they typically contribute a negligible amount of GHG when compared to the CO2 emissions. For this analysis, only CO2 emissions from fuel combustion were estimated and the units CO2 and CO2e are used interchangeably.

GHG emissions from operation of the existing quarry and the proposed project were calculated for baseline conditions in 2010. Direct emission sources at the quarry include the diesel generators and exhaust from mobile off-road equipment. Indirect emission sources include vehicle exhaust emissions from trucks and employee vehicles while traveling on and off site. For the proposed project, direct emission sources at the quarry are the same as the existing quarry, but at increased annual production rates and equipment use, as well as additional sources at the asphalt plant. Sources at the asphalt plant include the asphalt drum mixer and the hot oil heater, both of which would combust diesel fuel, and exhaust from off-road mobile equipment operating at the site. Indirect sources include vehicle exhaust emissions from trucks and employee vehicles while traveling on and off site, and from the generation of electricity provided to the site by PG&E.

The electricity usage for the asphalt plant was estimated using energy usage at another asphalt plant using a factor of 2.6 kilowatt-hours (kW-hr) per ton of asphalt produced[107]. Electricity usage for the proposed asphalt plant at the maximum annual production rate of 150,000 tons of asphalt per year was estimated as 390,000 kW-hr per year. GHG emissions from electricity were calculated using the PG&E GHG emission factor of 0.542 lb CO2e per kW-hr.[108] This emission factor takes into account the current mix of energy sources used by PG&E to generate electricity.

Table 4.6-21 provides the GHG emissions from the proposed project and shows the net GHG emission increase compared to baseline quarry operations (refer to Table 4.6-5 for baseline GHG emissions), along with the MCAQMD GHG significance threshold.

The project would increase GHG emissions by as much as 4,865 metric tons of GHG per year. This amount of GHG produced by the project would not have any measurable direct effect on the global climate. However, project emissions would be an increment of projected future GHG emissions, and these emissions are projected to cause the Earth's climate to change. Local effects of this climate change could include a reduction in water supplies in the Russian River and other County streams; a reduction in plant and wildlife populations due to habitat changes; more demand for energy due to increased hot spells; heat-related illness and death; raising the ocean level causing flooding of some coastal properties; and many other adverse environmental effects.

It is estimated that the County annually generates approximately 1.1 million tons of GHG (CO2 equivalent). The project's generation of GHG would be about 0.5% 0f the County total.[109]

Asphalt and aggregate, unlike many manufactured products, are produced to meet specific construction needs. Construction does not increase when a new mine or processing facilities are developed nor does it decrease if those materials need to be provided by more distant producers. Therefore, if these materials are not produced at Harris Quarry, they will continue to be produced at other quarries and processing facilities. It is expected that the project could reduce projected GHG emissions for the following reasons:

- The proposed asphalt facility would be a modern state-of-the-art facility. It would be expected to be cleaner and more efficient than older asphalt plants in Ukiah, Cloverdale and elsewhere in the region. Therefore, producing asphalt at Harris Quarry would generate less GHG than is generated by existing plants.

- Centralizing the facilities between Willits and Ukiah would allow shorter access to both communities than from quarries north of Willits to Ukiah, from quarries in Lake County to Willits or Ukiah, and from asphalt processors to sites in the Willits area. This would further reduce GHG emissions.

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[107] Greenhouse Gas Emissions Inventory, CEMEX Jesse Morrow Mountain Plant. Environ International Corp., August 31, 2009.

[108] http://www.pge.com/about/environment/calculator/assumptions.shtml

[109] *Energy Usage and Its Impact on Mendocino County*, Mendocino County Energy Working Group, 2007 Draft.

Table 4.6-21
Summary of Harris Quarry Proposed Project Greenhouse Gas Emissions

Emission Source	Greenhouse Gas Emissions (CO2e) (short tons/year)[a]	Greenhouse Gas Emissions (CO2e) (metric tons/year)
Proposed Quarry		
Emission Source		
Diesel Generators	1,452	1,317
Off-Road Equipment Exhaust	888	806
Quarry Subtotal	2,340	2,123
Proposed Asphalt Plant		
Emission Source		
Mobile Equipment Exhaust	99	90
Asphalt Plant Dryer	2,475	2,245
Hot Oil Heater	1,074	974
Asphalt Plant Subtotal	3,648	3,309
Total Direct Emissions	**5,988**	**5,432**
Indirect Emissions		
Emission Source		
Asphalt Plant Electricity Use	102	93
On-Road Truck Exhaust	1,848	1,676
Employee Vehicles	57	52
Total Indirect Emissions	**2,007**	**1,821**
Proposed Project Total Emissions (Direct + Indirect)	**7,995**	**7,253**
Baseline Quarry Operation	2,633	2,388
Proposed Project Net Increase	**5,362**	**4,865**
MCAQMD Threshold	**-**	**10,000**
Significant (Yes or No)?		**No**

[a] A short ton is the standard ton in the U.S. (1 short ton = 2,000 lbs)

The net increase in GHG emissions from the project would be less than the MCAQMD suggested significance threshold, and therefore the project's increase in GHG emissions would be a ***less-than-significant impact.***

Impact 4.6-I The proposed project could conflict with applicable GHG plans, policies, or regulations of an agency adopted for the purpose of reducing greenhouse gases.

Currently neither Mendocino County nor the MCAQMD have adopted a Greenhouse Gas Reduction Plan or Strategy that would apply to the project. On the State level the applicable plan, policy, or regulation would be the California Global Warming Solutions Act of 2006 (AB 32). As discussed earlier, AB 32 requires that greenhouse gases in California be reduced to 1990 levels by the year 2020. The project will increase GHG

emissions by 4,865 metric tons per year which will make it more difficult for the State to meet AB 32 targets.

As mentioned previously, part of the traffic study conducted for the applicant included an analysis of vehicle miles traveled (VMT) with and without the project was conducted. The VMT study examined the demand and supply of aggregate and asphalt within the County, what levels of demand there will be in different areas of the County, where aggregate and asphalt facilities are located relative to the demand locations, and projected the number and lengths of trips required to satisfy the demand, both with and without the project. Because the project is close to major population centers and geographical centers of the County, aggregate and asphalt trip lengths would be shorter and the total VMT to satisfy countywide demand for these products would be reduced with the project. The project has the potential to decrease the total VMT associated with hauling aggregate and asphalt within Mendocino County by approximately 183,500 VMT annually. This reduction in VMT would result in an overall net reduction in GHG emissions in the County from transportation sources. Reduction of GHGs from the transportation sector is one of the goals of AB 32 and other GHG plans and policies. Nevertheless, the GHG emissions from the project may make it difficult for the State to reach AB 32 targets and thus conflict with State policy. This is a ***potentially significant impact.***

This impact would last for about 30 years until the site is reclaimed. Once the site is replanted and reclaimed per the Reclamation Plan, there will be a reduction in GHG emissions to below 1990 levels. At that time, the project would be consistent with AB 32.

Mitigation Measures

The California Climate Action Team's Report to the Governor recommended emission reduction strategies, and the State Attorney General has also developed a list of feasible emission reduction strategies. This EIR recommends the following mitigation to minimize this impact.

4.6-I.1 The applicant shall reduce greenhouse gas emissions from the project by conducting at least the following actions:

- Comply with California Air Resource Board standards for light duty and heavy duty vehicles. All vehicles will need to continue to abide by these standards, including possibly stricter standards set in the future.
- Restrict idling of diesel engines on the site to less than 5 minutes.
- When replacing diesel mobile equipment, purchase new equipment meeting the most recent CARB emission requirements.
- Maintain facility mobile equipment in good working order.
- Reclaim the site.
- Use energy efficient appliances and lighting. All new equipment shall be energy efficient. Except where needed for outdoor work or security, all new lighting shall use fluorescent lighting.
- Increase new building efficiency by 20% over Title 24 standards.
- Meet Green Building Code standards for new building construction.

- If available, use clean alternative fuels.
- Use electricity provided by PG&E to the maximum extent possible to replace electricity generated by the on-site generator.
- Install solar panels to power the electrical demands of the office and outdoor lighting.
- Install any additional features recommended by the MCAQMD.
- Have an energy audit conducted by a qualified individual or firm to identify additional methods to conserve energy (this may include installation of solar panels or other on-site electrical generation facilities). The audit shall be done prior to construction and will confirm that all new equipment and appliances meet accepted standards for energy efficiency.

Impact Significance After Mitigation

The project will generate GHG emissions at levels below the MCAQMD-recommended significance threshold for GHGs. The mitigation strategies described above would further reduce the project's GHG emissions and are consistent with State recommendations for GHG reduction for projects such as this. This mitigation would reduce the potential policy inconsistency to a ***less-than-significant*** level. However, as described in detail in Section 4.13 (Plan Consistency) of this EIR, because policy and plan inconsistencies are not environmental impacts in and of themselves, the County during its review of this EIR and the project will make the final determination of policy consistency.

Cumulative Air Quality

Impact 4.6-J Additional project-related truck traffic on U.S. 101 would increase regional emissions of criteria pollutants.

Future growth in the area will increase emission of pollutants into the air. As noted in Section 4.4 (Traffic), Caltrans predicts a 50 percent increase in traffic on Highway 101 between 2006 and 2025. The increased haul truck traffic generated by the project would be an increment of this cumulative impact. Operation of the proposed project would generate additional haul truck traffic traveling along Highway 101 to job sites in the region. The change in truck traffic on U.S. 101 associated with the proposed project is described in Section 4.4.

On a net basis, there would be about 63 additional project-generated daily trucks (126 trips) on Highway 101. About 15 trucks would be traveling on Highway 101 north of the quarry and 48 south of the quarry.

Potential cumulative impacts from the quarry truck trips when combined with projected future emissions from truck traffic on Highway 101 were assessed by comparing the change in future emissions with and without the project, as well as by comparing these emissions to existing emissions. Existing average daily truck traffic volumes for Highway 101 between Ukiah (junction with Highway 20 East) and Willits (junction with Highway 20 West) for 2009 reported by Caltrans (Caltrans, 2010) were used to represent existing conditions. Truck traffic for future years for Highway 101 were not available, so projected

traffic volumes were estimated assuming a linear increase of 2.5% per year, with years 2010 and 2030 used to represent baseline and future year conditions.

Total daily emissions per mile from all diesel-fueled heavy duty trucks traveling on Highway 101 between Ukiah and Willits were developed using the existing and future daily traffic volumes and pollutant emission factors for trucks. Emissions of criteria pollutants (VOC, CO, NOx, and PM10) and DPM (assumed to be the same as the PM10) were calculated. Emission factors for the heavy duty trucks were calculated using the CARB's on-road mobile source emissions inventory program EMFAC2007 with default Mendocino County vehicle data and conditions for 2010 and 2030. The emissions factors were computed using the average daily truck emissions and truck vehicle miles traveled in the County. The emission calculations are provided in Appendix D.

Existing and future truck volumes, with and without the project trucks, and associated daily emissions per mile for each pollutant and DPM are summarized in Table 4.6-22. The net increase in daily project truck traffic represents a 5.5 % increase in heavy duty trucks along Highway 101 in 2030 compared to truck traffic without the project. Compared to the total traffic volumes (all vehicle types) the project trucks represent an increase of about 0.3% in daily volumes compared to 2030 without the project.

As can be seen from the table, emissions of all pollutants, as well as DPM, decrease in the future years, both without and with the project, even with increased traffic volumes compared to the existing conditions. Therefore, future emissions and any associated impacts from trucks on Highway 101 will be less than current conditions and the project's contribution to the cumulative impact would be a ***less-than-cumulatively considerable*** contribution.

Table 4.6-22
Cumulative Truck Emissions on Highway 101 [a]

	Existing 2010	Future Without Project[b] 2030	Net Increase In Project Trucks Trips[c]	Future With Project 2030
Traffic Data				
No. Heavy Duty Trucks (HDT)/day	1,178	1,752	96	1,848
Total No. Vehicles/day	19,731	29,356	96	29,452
Total Daily HDT Emissions (lb/mi)[d]				
VOC	1.5	0.5	-	0.5
CO	3.9	3.3	-	3.5
NOx	33.8	7.0	-	7.4
PM10 & DPM	1.2	0.4	-	0.4

Notes: [a] Total vehicle and heavy duty truck data for Highway 101 between Highway 20 East (Ukiah)
and Highway 20 West (Willits)

[b] Future year traffic volumes based on projected increase of 2.5% per year (52.5% increase for 2030)

[c] Represents the net daily change in Project truck traffic on Highway 101 (net increase of 48 trucks per day, or 96 truck trips)

[d] Emissions represent the daily average total emissions for all diesel-fueled heavy duty trucks per mile of Highway 101 in the project vicinity

4.7 AESTHETICS

A. Setting

1. Existing Views of the Quarry

The existing quarry is visible from Highway 101 and from locations on the Ridgewood Ranch to the south. It is also possibly visible from distant high elevation points to the south and southwest.

Traveling north on Highway 101, the quarry face is first visible about 100-200 feet north of the intersection of Ridgewood Road with the highway. The mined face is visible from this location with the adjacent hill (called "the volcanic knob") on Ridgewood Ranch immediately to the south and the forested ridge in the background to the west. The quarry face becomes increasingly visible as one travels uphill (north), though views are intermittent as there are locations where views of the quarry are blocked by roadside topography or vegetation. At 0.9 miles from Ridgewood Road, the quarry face is very prominent immediately adjacent to the highway as it passes by the quarry. This foreground view dominated by the quarry is visible for about 0.2 miles until one passes the quarry. The quarry face is visible intermittently for about 1.1 miles driving up the Ridgewood Grade. From these highway vantage points, the view of the project site is characterized by the exposed rock on the quarry face with still vegetated slopes above the face. The view is framed by a vegetated, undeveloped ridge and hills.

Traveling southbound on the highway, the existing driveway is visible immediately south of Black Bart Drive. The driveway is not particularly noticeable as it accesses the highway; the wooded hillside behind (west) of the driveway is the dominant visual resource in this area. The quarry is visible at a point about 0.2 miles south of Black Bart Drive. The quarry is visible only for a short distance (about 0.1 miles) as the highway passes the quarry. In this southbound direction, one can look right and down from the right lane and see the quarry equipment on the quarry floor.

Driving west on Ridgewood Road, there are two locations (just uphill from where the old Highway 101 intersects Ridgewood Road and where the driveway to the Church complex forks off the main road) where one can see the quarry face to the north; these views are limited by vegetation and topography so that the quarry is visible for only 100 feet or so. Otherwise, the quarry is not visible from the paved roads on Ridgewood Ranch. It is not visible from those parts of the ranch where people live or the areas most used, though one can see a portion of the quarry face from various locations such as the lake to the west of the main compound and undoubtedly from higher elevation vantage points. Except for a few locations driving down the first part of Ridgewood Road or higher elevation locales to the east of Highway 101, the quarry is a small part of a long-distance view. In many locations where it is visible, one would need to know where to look to see the quarry face.

2. Existing Views of the Proposed Asphalt Processing Facility Site

Starting at Highway 101 and driving west on Black Bart Drive, the driver sees forested hillsides on both sides of the road. Further uphill, the road enters a more open oak woodland, and at 0.3 miles from the highway, one reaches the site of the proposed processing facilities. If one looks left (south), one sees oak woodland with large oaks scattered through open grassland. The site is visible for a matter of seconds as it is not visible until one rounds a turn and then one is immediately driving uphill away from the site. This view is framed by distant wooded ridges to the south and west. One proceeds uphill from the site along the crest of the ridge through oak woodland and then mixed evergreen forest.

Driving east on Black Bart Drive from Ridgewood Subdivision, one travels downhill through the oak woodland and enters an opening where one can see the ridge behind (east) of the site in the background, but the site itself is screened by large oaks in the foreground along the road. Another 200 feet downhill, the road bends to the right and one can see the site; this is approximately one-quarter mile from the site. From here, the road swings back to the left, and again there are trees screening the site. At about 0.2 mile from where the site is first visible one approaches the site. This is the first vantage point where the site is clearly visible. One looks directly down on to the site with views of the open grassland and scattered large oaks backdropped by the wooded hill on the east side of the site. This clear view of the site lasts for about 500 feet until one passes the gate to the site where the road swings to the left away from the site.

The site is also visible from higher elevation vantage points in the Ridgewood Subdivision to the west, including from a few residences or areas near residences. From these vantage points, the site is part of a panoramic view of wooded hills including the project site in the midground approximately 1 or more miles to the east with the higher ridge further to the east in the background.

B. Potential Impacts and Mitigations

1. Criteria Used to Determine Impact Significance

A project will typically have a significant impact if it meets any of the following criteria:

- Has a substantial adverse effect on a scenic vista.
- Substantially damages scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway.
- Substantially degrades the existing visual character or quality of the site and its surroundings.
- Creates a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

While all projects create some visual change, CEQA provides little guidance about how much change or what type of change is significant. Most EIRs rely on two methods to determine if the change is significant. The first is conformance with public plans, and the second is a visual analysis. Section 4.11 (Plan Consistency) discusses project consistency with public plans, and the visual analysis is presented here.

2. Project Impacts

The proposed project includes expanding the existing quarry and constructing a new asphalt processing facility on Black Bart Drive. This asphalt processing facility can be operated at night, with corresponding lighting impacts.

The project area does not contain a State scenic highway nor are any of the resources on the site designated as "scenic resources" by the County or State. This section assesses the impacts to the visual character of the area, including impacts from new lighting.

a. Background Information

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.

The measure of the quality of a view must be tempered by the overall sensitivity of the viewer. Viewer sensitivity or concern is based on the visibility of resources in the landscape, proximity of viewers to the visual resource, elevation of viewers relative to the visual resource, frequency and duration of views, number of viewers, and type and expectations of individuals and viewer groups.

The importance of a view is related in part to the position of the viewer to the resource. Therefore, visibility and visual dominance of landscape elements depend on their placement within the viewshed. A viewshed is defined as all the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., a roadway or trail) (Federal Highway Administration, 1983). To identify the importance of views of a resource, a viewshed is broken into distance zones of foreground, midground, and background. Generally, the closer a resource is to a viewer, the more dominant it is and the greater its importance to the viewer.

As noted above, visual sensitivity depends on the number and type of viewers and the frequency and duration of views. Visual sensitivity is also modified by viewer activity, awareness, and visual expectations in relation to the number of viewers and viewing duration. For example, visual sensitivity is generally higher for views seen by people who are driving for pleasure, people engaging in recreational activities such as hiking,

biking, or camping, and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or shopping or as part of their work (U.S. Forest Service, 1974, Federal Highway Administration, 1983, and U.S. Soil Conservation Service, 1978). Commuters and nonrecreational travelers have generally fleeting views and tend to focus on commute traffic, not on the surrounding scenery. Therefore, they are generally considered to have low visual sensitivity. Residential viewers typically have extended viewing periods and are concerned about changes in views from their homes. Therefore, they are considered to have high visual sensitivity. Visitors using recreation trails and areas, scenic highways, and scenic overlooks are usually assessed as having high visual sensitivity.

Judgments of visual quality and viewer response must be made on a regional frame of reference. The same landform or visual resource appearing in different geographic areas could have a different degree of visual quality and sensitivity in each setting.

Given these criteria, the quarry site is considered to have high sensitivity from Highway 101 (due to its heavy use by recreational travelers) and low to moderate sensitivity from Ridgewood Ranch vantage points (as it is not visible from many residences). The asphalt processing facility is considered to have moderate sensitivity for people commuting on Black Bart Drive and several residences that are relatively near the site, and low to moderate sensitivity from other public streets, more distant homes, and public open space.

The visual analysis presented here focuses on the visual impacts that would result from expanding the quarry and the construction and operation of the processing facilities.

b. Photo-Simulations

To assist in the visual impact assessment, photo-simulations of the future operations were prepared. The EIR visual expert (Visual Impact Analysis) prepared these simulations by taking a series of photographs from surrounding vantage points. Viewpoint photography is a single film frame 35mm digital color photographed with a normal lens (i.e., to show what the human eye actually sees – it is not a blow-up or wide angle of the view).

The second step is to develop a 3D digital model of the site and the proposed project, grading, and landscaping (DTM). The 3D CAD model can be oriented and scaled as needed from any position or potential viewpoint. This 3D surface model when oriented according to the viewpoint position coordinates will provide line-of-sight, general visibility and scaling information for the photomontages.

VIA utilized and expanded the 3D DTM produced by the project engineers. VIA utilized digital contours supplied by project engineers and then introduced visible new structures into the database. The source of viewpoint elevation data was project topographic mapping and USGS 7.5 minute Quad mapping for areas not covered by project mapping. The DTM consisted of the project property and surrounding topography as needed. Existing tree information was not detailed and therefore was analyzed as a best approximation of tree massing in the Project engineering drawings.

VIA used work products and information from the Digital Terrain Model as the basis for analysis and production of computer-generated photosimulations that address visual impacts of the proposed project. Overlay plots of the DTM were generated for each view. The plots were scaled to the photo according to viewpoint location coordinates recorded with handheld WAAS (wide area augmentation system) enabled GPS.

VIA generated one "before" (existing conditions) photograph and one "after" photomontage for each viewpoint. The "before" views are unaltered and unmanipulated, and are provided for comparison purposes. The "after" views contain proposed project features and elements such as grading, new structures, major roads, and tree removal, digitally photomontaged into the viewpoint photos. Structures have architectural detail with the exception of the original nighttime simulation of the asphalt facility, which was montaged using scaled photos of existing facilities similar to those proposed. The daytime facility is a rendered plan-specific digital model. Tree removal resulting from the project is shown in the photomontages as well. Trees added to depict projected reclamation are sourced from photos of specified or similar species.

Digital renderings of grading are by computer and montaged into the viewpoint photos. Photo texture of quarried rock was added to the digital renderings where appropriate to convey realism. They are situated, oriented, and scaled using Computer Aided Design techniques. Landscape reclamation elements are digitized photographs of major specified tree species at a low level of maturity. Orientation and scale of project elements was based on project documents and the DTM.

Dozens of photographs were generated from surrounding vantage points. Prior to preparing the original 2007 EIR, these photographs were presented to the County Department of Planning and Building Services staff. Staff determined that the three vantage points should be: 1) from Black Bart Drive immediately west of the asphalt processing facility site; 2) from Highway 101; and 3) from Ridgewood Ranch. In addition a nighttime simulation was prepared from the Black Bart Drive vantage point.

The County determined that the photosimulation done from Ridgewood Ranch and the nighttime simulation did not need to be redone for this Revised DEIR. The original simulations show the approximate area of disturbance for the revised project. Actually, the simulations overstate the impact because the revised project does not extend as far west as the original project, so some of the area that is shown as mined in the simulations would remain in a natural state. The nighttime simulation would also change somewhat as the position of the asphalt plant and proposed lighting has shifted. However, it was determined that the original nighttime simulation provided a sufficient presentation of what the changes in night views would be.

Therefore, these original simulations are included here with the understanding that the simulation from Ridgewood Ranch overstates the area of disturbance. A new simulation has been prepared for the daytime view from Black Bart Drive. The original nighttime simulation is used. It significantly overstates the impact as the silos that are the main source of light intrusion have been relocated so they are not as visible. In addition, the new simulations are based on an actual model of the asphalt plant, whereas the original simulation was based on approximations of the size and appearance of the project elements.



Harris Quarry Viewipoint Key Map
Figure 4.7-1

Source: *Visual Impact Analysis LLC*

Changes to Views from the West

Impact 4.7-A The processing facilities site would change views from Black Bart Drive and Ridgewood Subdivision.

As shown on Figure 4.7-2 (Existing and Proposed), the asphalt processing facility would substantially change views of the site from Black Bart Drive. The oak savannah and wooded hillside will be graded to a level pad and developed with a fence, processing facilities, vehicles, and piled aggregate. The photo-simulation shows that the perimeter fence will be visible with aggregate piles behind the fence and the taller asphalt structures to the southeast. The cut slope to the east (shown here revegetated with grass) would be visible behind the processing structures. The project will introduce a view of industrial development into an open space vista. The proposed tree plantings would begin screening views of improvements immediately. Sample trees (8-feet high) have been added to Figure 4.7-2 to represent the applicant's proposed planting plan. The applicant has 150 oaks in containers that are at least 5 years old and ranging in size up to 6+ feet high. These trees will be used for planting this area and other reclamation planting.

Views of this new development are relatively limited along this road. The photo-simulation is from the most affected vantage point immediately west of the site. East of the existing access to the site, views will be buffered by the existing topography (that will not be removed) and existing trees. However, one may be able to see the upper portion on the silo and the tops of aggregate storage piles.

As discussed before, this unimpeded view of the site is possible for about 500 feet along Black Bart Drive. Traveling at 25 mph, the processing facilities would be visible for less than 15 seconds. The tops of the silos and possibly other facilities would be visible from a turnout further west and possibly from other locations within one-quarter mile of the site. Other than the unimpeded views immediately adjacent (500 feet) to the site, views from Black Bart Drive are blocked by topography and/or roadside trees. It is expected that, at most, the tops of the silos might be visible for a distance of up to one-quarter mile to the west.

As shown on Figure 4.7-2 (Proposed), some of the existing trees between Black Bart Drive and the facility will be retained. Eleven new oaks will be planted between Black Bart Drive and the northeast corner of the site. Eight oaks and nine Douglas fir will be planted adjacent to Black Bart Drive near the emergency access to Black Bart Drive and extending northwest past the west end of the bio-retention area. Over time, the view shown in Figure 4.7-2 will be modified by these trees, and less of the site will be visible from Black Bart Drive. It is expected that in 10-15 years, these trees, if adequately fertilized, watered, and maintained, will screen most views of the processing facilities.

The revised site plan has substantially less visual impact than the original site plan. This is because the silos have been relocated to the southwest, the aggregate piles added along the perimeter, and screening trees added.

The asphalt processing facility will be visible from a few residences on the Ridgewood Subdivision. The industrial buildings and silos would introduce an industrial view into a current undeveloped open space view.

Though the new processing facilities would be visible from relatively few vantage points, they do represent the introduction of industrial facilities into an undeveloped open space vista. This would be a ***potentially significant impact.***

The project also includes completion of a new access road between the quarry and the asphalt processing facility (and the access to Highway 101). This road parallels Black Bart Drive from about 250 feet west of Highway 101 to the asphalt processing site; for most of this 1,500-foot length of the road, it is within about 50 feet of the edge of Black Bart Drive. Most of this road has already been graded under a County-issued grading permit. The portion that remains to be built is in the heavily wooded area northwest of the existing project access to Highway 101. The 500-foot long road would connect the existing road to the asphalt processing facility with the project access at Highway 101. Due to heavy tree cover between the proposed road and Black Bart Drive, it is not likely that this road or the hillside cut required for that road will be visible from Black Bart Drive. However, if portions were visible through the trees, this would add to the potentially significant impact on views from Black Bart Drive.

The project includes constructing a new road from the haul road to the existing water storage tank on the hill to the east of the site. There is an existing road to this tank but a new road with less steep slope will be built. It is not expected that this road will visible from Black Bart Drive due to intervening topography and trees.

A 3-foot wide rock-lined drainage ditch is proposed at the northwest end of the asphalt processing facility. This 80-foot long ditch will carry runoff from the northwest part of the site and the adjacent portion of the haul road to a ditch along Black Bart Drive. Travelers along Black Bart Drive will see this now drainage feature as they drive immediately past it. This relatively minor change in views is considered less than significant.

The project includes paving the existing and new roads. This paving would not have visual effects. The project also includes truck use of this approved haul road. This means that people driving along Black Bart Drive may see large haul trucks traveling along the lower elevation of the hill to and from the asphalt processing site. The access road is above the elevation of Black Bart Drive. This elevation differential plus remaining trees and other vegetation between the two roads would wholly or partially screen views of these trucks from many vantage points along Black Bart Drive. In addition, a traveler on Black Bart Drive would likely see one or perhaps two trucks at the most in the minute or less that it would take to drive this stretch of road. Therefore, the addition of views of trucks on this haul road would be a less-than-significant impact.

Mitigation Measures

4.7-A.1 The asphalt processing facility site shall be planted to screen views from Back Bart Drive. Once the asphalt processing site grading is completed, the applicant shall contract with an arborist to develop a final tree planting plan



Figure 4.7-2 Looking Southerly From Black Bart Drive - Existing View

Source: *Visual Impact Analysis LLC*



Figure 4.7-2 Looking Southerly From Black Bart Drive - Photo-Simulation of Proposed Asphalt Facility Source: *Visual Impact Analysis LLC*

along the frontage of the site. Plantings will start as the applicant has proposed about 500 feet west of the existing driveway and extend to a point opposite the northeast corner of the facility site. The arborist will determine whether the trees the applicant has available are suitable for the site, or, if not what species of trees shall be planted along this frontage to provide rapid screening of the site from the road. The planting should incorporate fast-growing trees that can quickly provide screening. If feasible, native trees and shrubs should be used. Preferably native oaks and Douglas fir will be incorporated in the planting scheme (which would count against the previous requirement for tree replacement), with oaks being planted behind the faster-growing screening plants or intermixed with them so that at the reclamation phase any non-native species can be removed to leave oak woodland. The plan will detail site preparation, planting, fertilization, irrigation, and performance monitoring as well as replacement standards.

4.7-A.2 All buildings and fencing shall be a green or tan color that best matches the vegetation on the hill to the east.

The EIR preparers considered mitigations that would relocate various facilities on the site, but none of the facilities are much more "attractive" than any of the others, plus there are operational constraints regarding where vehicles load and unload and where aggregate needs to be stored. While it might be possible to do some rearranging of components on the site, such rearrangement would do very little to mitigate the industrial look of the site.

The EIR preparers also considered the mitigation of constructing a berm west of the existing access road for about 400 feet. However, there is limited distance between Black Bart Drive and the proposed fence. A 8-foot high stable berm (about the height of the perimeter fence) that has a 10-foot wide top (suitable for container planting and maintenance) would need to be 52 feet wide (to have a 2:1 slope). There is not space for this large a berm, so either the berm would need to be lower, less planting space on top provided, and/or steeper slopes allowed. The advantage of the berm is that it would immediately screen views of the proposed fence. However, the disadvantages are the potential for increased erosion, changes to drainage along the road, and creating a “tunnel’ effect along the road. In addition, the tress that will be planted will quickly screen the improvements that would be screened by the berm and, as can be seen in the photo-simulation, soon screen most site structures.

Impact Significance After Mitigation

The landscaping mitigation would, over time, provide screening from Black Bart Drive. Painting facilities to blend with surrounding vegetation will also diminish the visual impacts. However, it is expected that it will take up to 10+ years before the new trees reach a height of 25-30 feet needed to screen the taller structures on the site. In addition, the screening would likely not be complete, allowing some views of the facility from Black Bart Drive as well as more distant views from the west. Although the impact is substantially less than was the case for the original project, it remains a ***significant and unavoidable impact.*** It is recognized that at the completion of mining the site would be reclaimed. Once reclamation is completed and the area was planted with

grasses and new oak trees, the visual impact would be less than significant. However, this reclamation would not occur for as long as 30+ years, so for the people currently living in the area, this would be a permanent impact.

Changes to Views from the South

Impact 4.7-B The quarry expansion would change views from vantage points on the Ridgewood Ranch.

The expanded quarry would be visible from many vantage points on Ridgewood Ranch. Figure 4.7-3 shows the original project; this simulation is from the main Church complex area. Note that this simulation overstates the impact since the revised project does not extend as far west as shown in the simulation. The volcanic knob just south of the quarry is visible from many locations. Almost everywhere that knob is visible, the expanded quarry face will be visible. Although the quarry face would be a relatively small part of the long-range views from most affected vantage points, it would be one of the few human caused phenomena visible on the hills surrounding the valley where most of the ranch use is centered. In addition, it is the high point when looking in that direction.

As shown in the photo-simulation the south end of the vegetated ridge would be reduced in elevation. One would see the mined face of the quarry bordered by remaining trees to the northwest. Reclamation would provide some future screening of the quarry face, but that screening would not occur for 30+ years.

There are other vantage points where the quarry face would also be visible, including the lake to the west of the main compound and higher elevation vantage points. The Church of the Golden Rule also owns property to the east of the quarry site, including land at higher elevations that has views down onto the quarry. Because this ranch is being placed in conservation easements and is used for recreational and educational purposes, this change in views is considered a ***potentially significant impact.***

The Church has created five residential lots in this area that could in the future be sold as large lot residential parcels. The quarry would be an unattractive element for views from some vantage points on these lots. However, there currently are no homes in these locations, so impacts are limited to Church personnel who visit this area for maintenance or leisure purposes. Given that there are no permanent residents in this area and that the area is not heavily visited, the view of an increased quarry from this area is considered a less-than-significant impact.

Mitigation Measures

There are no mitigations for this impact.

Impact Significance After Mitigation

As is discussed in more detail in Impact 4.10-B, Ridgewood Ranch is a sensitive biological and historical resource, which is being preserved through the purchase of conservation and other easements. It is also the home of Church residents and other



Figure 4.7-3 Looking North From Ridgewood Ranch Stables - Existing View of Quarry

Source: *Visual Impact Analysis LLC*



Figure 4.7-3 Looking North From Ridgewood Ranch Stables - Photo-Simulation of Proposed Quarry Expansion Source: *Visual Impact Analysis LLC*

residents. The lowering of the ridge and the change in views along the skyline would adversely affect views from the ranch. This is considered a ***significant and unavoidable impact***.

Lighting Impacts

Impact 4.7-C Lighting of the processing facilities would impact night views in the area.

As shown in Figure 4.7-4, the lights at the asphalt processing facility when nighttime operations are occurring (up to 100 nights per year) would be very noticeable for drivers near the site on Black Bart Drive. Again, this simulation substantially overstates the impact as tall silos have been relocated to the southwest so they are not straight ahead of drivers traveling east, and because the cement facility (and its lights) have been eliminated from the revised project. Some residents living to the west in the Ridgewood Subdivision would also have direct views of these lights. Residents in that subdivision as well as residents on Ridgewood Ranch would notice a glow in the night sky. Given the generally dark nighttime visual environment, these lights would have a ***potentially significant impact*** on residents in the area and travelers on Black Bart Drive.

On nights when nighttime operations are not occurring, there would be security lights on at the asphalt processing facility site and at the quarry site. The current proposal includes shielding of these lights. However, if these lights are not properly installed, they could also have a ***potential significant impact.***

This EIR requires lighting of the project access driveway when nighttime operations are occurring (in order to reduce traffic safety hazards). This will add lighting to a currently dark landscape. However, the lighting would not affect residences and would be seen only by passing travelers on a State highway. This periodic lighting would have a less-than-significant visual impact.

Mitigation Measures

The applicant has mitigated lighting impacts by requiring minimal security lights and shielding of lights. To ensure that final design includes these already-proposed measures as well as some additional recommendations, the following mitigation is recommended.

4.7-C.1 Final design and construction shall include no lighting of the asphalt processing facility site except when there are active nighttime operations occurring and for security lighting. The lights will be shielded (90 degree cut-off shielding) lights at no greater than 10 feet in height. Operational lighting will be on light poles distributed to have forward-throw lighting and light trespass cut-off shields. No direct lighting shall be visible from off the site.

Lights will be selected from the list of approved security lights adopted by the International Dark Sky Association (IDA). No pinkish, yellowish, or bluish colored light sources will be used. The minimum number of security lights

needed for security purposes as determined by the Mendocino County Sheriff's Department will be installed.

Impact Significance After Mitigation

The mitigation would reduce security lighting impacts by limiting the time they are on to only when movement is recorded on the site. However, lighting needed for operating the processing facilities would be visible for up to 100 nights per year. The mitigations recommended above would shield lights so that they would be barely visible or not visible from residences on the Ridgewood Subdivision and would reduce the night glow impact to these residents to a less-than-significant level. However, there is no mitigation for the lighting impacts from nighttime processing operations on drivers traveling on Black Bart Drive near the site and on some residents living to the west of the site. This would remain a ***significant and unavoidable impact***.

Impacts to Wilderness Areas

Impact 4.7-D The project could adversely affect views from Federal Wilderness Areas.

Several commentors on the original Notice of Preparation requested that the EIR assess potential visual impacts of the project on newly-created Federal Wilderness Areas in the County.

In October 2006, the president signed into law the Northern California Wilderness Heritage Act that added wilderness designation to two existing Wildernesses (Yolla Bolly-Middle Eel Wilderness and Snow Mountain Wilderness) and established two new Wildernesses (Yuki Wilderness and Sanhedrin Wilderness) as well as designating Black Butte River as a Wild and Scenic River.

The nearest of these Wildernesses (the new Sanhedrin Wilderness) is approximately 15 miles east of the project site. Using binoculars, it might be possible to see the project from higher elevation vantage points in this Wilderness (or other more distant Wildernesses). It is very unlikely that one would be able to see the project, even if it were within the line of sight, with the naked eye. The project site would be a part of a distant backdrop. It is possible that people at higher elevations on these Wildernesses might be able to see lights at the processing facilities when nighttime operations were occurring (or even just the security lights). However, the asphalt processing site is blocked from most views from the east by the hill to the east of that site. Even if there was a clear line of sight, it is expected that very few people would be at these higher elevations in the dark. In addition, the lights would probably look like a single light source from that distance, and it would not substantially alter the nighttime views. The project would not significantly affect views from these Wildernesses, and would not adversely affect the wilderness experience of people using those Wildernesses. The impact would be ***less-than-significant.*** In addition, the mitigations required for the previous four impacts would further reduce any impacts from these distant vantage points.



Figure 4.7-4 Looking Southerly From Black Bart Drive - Nighttime Existing View

Source: *Visual Impact Analysis LLC*



Figure 4.7-4 Looking Southerly From Black Bart Drive - Nighttime Photo-Simulation of Proposed Asphalt Facility Source: *Visual Impact Analysis LLC*

3. Cumulative Impacts

Cumulative Changes to Views from Highway 101

Impact 4.7-E The quarry expansion and highway improvements would change views from Highway 101.

As described in the Setting section, the quarry is visible intermittently on Highway 101 for about 1.1 miles north of Ridgewood Road. Figure 4.7-5 was taken from about 0.8 mile south of the quarry and shows how the bare face of the quarry would expand. Again, this simulation of the original quarry proposal overstates the impact since the revised project does not extend as far to the west as shown in this simulation. The face of the quarry is already very noticeable, particularly as one gets nearer the site. Quarry expansion would increase the area of disturbance and remove an additional 19 acres of chaparral and tanoak woodland. While there would be an expanded area of disturbance, the fact is that the main impact to area views has already occurred. Therefore, the project itself would not have a significant impact on views, but the cumulative impact of the project expansion of the area of disturbance plus past actions (i.e., the existing quarry) would be considered a ***potentially significant cumulative impact.***

The proposed improvements at the access driveway would change views for travelers as they pass this point. There would be additional paving visible. South of the quarry access driveway the highway would be widened for about 1,390 feet. Trees in this area between the highway and the quarry driveway would be removed. Travelers driving north would not see roadside trees between the quarry and the access driveway intersection with the highway. The driveway will be widened and the new access road will be visible behind the driveway entrance. The result will be that people passing the driveway entrance will see a wider area of paving than is currently visible. For a fraction of a second, if looking right at the driveway, travelers would also see the southernmost portion of the cut on the west side of the new access road. Once past the driveway intersection that road cut would not be visible due to topography and intervening trees.

North of this driveway intersection, the woodland to the west would be reduced as trees would be removed to allow highway widening. However, these changes plus the widening of the highway would not be expected to be particularly noticeable to people driving at fairly high speeds along this approximately 1,700-foot long section of highway. The expansion of the quarry itself would change views from the highway, and the highway widening and improvements to the access driveway intersection would add to this change.

If the quarry were expanded in the future, the footprint of the quarry would become somewhat larger than for the proposed project. A photo-simulation of this larger footprint was prepared for the original Draft EIR on the original project. It was concluded that this would be a significant cumulative impacts.

Mitigation Measures

4.7-E.1 The area west of Highway 101 between the highway and the newly constructed access road shall be replanted to screen views of the quarry from Highway 101. The tree planting plan required in Mitigation 4.7-A.1 shall include a plan for replanting the area between the project access driveway intersection with Highway 101 and the south end of the quarry site along the highway frontage. This area shall be planted with fast-growing trees that can quickly provide screening to twenty feet above the highway elevation. These trees shall be fertilized, irrigated and maintained by the applicant.

4.7-E.2 The sign at the quarry entrance off the highway shall be kept small and unobtrusive; it shall not exceed 40 square feet.

Impact Significance After Mitigation

The recommended mitigations would reduce the impact, but it is not possible to substantively screen the quarry expansion for northbound travelers. The project would make a short-term ***cumulatively considerable contribution*** to a ***significant and unavoidable cumulative impact***, and it would also be a contribution to the long-term impact if the quarry were expanded in the future.



Figure 4.7-5 Looking From US 101 Northbound - Existing

Source: ***Visual Impact Analysis LLC***



Figure 4.7-5 Looking From US 101 Northbound - Proposed Project

Source: ***Visual Impact Analysis LLC***

4.8 PUBLIC SERVICES AND UTILITIES

CAL FIRE and the Little Lake Fire Protection District were re-contacted while preparing the Revised Draft EIR to ensure that the description and impact assessment presented is accurate. The discussion of project water demand was revised given new data provided by the applicant on project water sources and water demand. The discussion of wastewater was revised to reflect the proposed new location of the leachfield.

A. Setting

1. Fire and Emergency Medical Service

Fire protection and emergency medical services would be provided by the Little Lake Fire Protection District (LLFPD) and the California Department of Forestry and Fire Protection (CAL FIRE).

a. Little Lake Fire Protection District

The project site is within the area served by the Little Lake Fire Protection District (LLFPD). LLFPD serves both the City of Willits and the surrounding areas. It is funded by property taxes, a special fire tax, and fundraisers. The District encompasses 380 square miles that has a population of over 10,000 residents. The District is staffed by three paid personnel and 37 volunteer firefighters. Paid staff includes the Fire Chief, a training officer, and a mechanic.

The District includes two stations; the main station on East Commercial Street in Willits and a second station on Baechtel Road in Willits. The main station has two Incident Command System (ICS) Type 1 engines, three Type 3 4-wheel drive engines, and one rescue vehicle. The Baechtel Road station has one Type 1 engine, one Type 3 4-wheel drive engine, one 4,000-gallon water tender, and one 75-foot ladder truck. Volunteers include 13 EMTs, and the rest are First Responders.

Of the 600 annual emergency responses, about 50% are emergency medical responses, 12%, are to wildfires, and 35-40% to other fires. LLFPD annually responds to an average of 1-2 structure fires and 1-2 wildfires in the project area and the Ridgewood Subdivision to the west.

The District's ISO (used for determining fire insurance) rating is 4 inside the City of Willits and in outlying areas with hydrants, and a Rural 8 in outlying areas within 5 miles of the stations, including the project site. Fires reported in this area igniting during the fire season would be responded to by both CAL FIRE and LLFPD. Initial attack would include:

- LLFPD would dispatch 2 engines, a water tender, and a chief officer, as well as firefighters.

- The Howard Forest station would dispatch 1-2 engines, a chief officer, a bulldozer and a helicopter.

- CAL FIRE would dispatch 1 chief officer, 1 air tactical plane, 0-2 air tankers. 1 helicopter, 2-5 engines, and 1-2 fire crews, depending on the fire hazard severity at the time of the fire.

If a fire ignited on the project site, CAL FIRE would be the first responder if the Howard Forest station was staffed when the fire ignited. It would take 10-15 minutes for the first LLFPD engine to arrive. Responding engines are typically equipped with a type of foam that is very effective for suppressing combustion of flammable fuels.

LLFPD has stated that the quarry operators have complied with all of the District's requirements in the past and have operated an incident-free operation since their start-up.[110]

b. CAL FIRE

The California Department of Forestry and Fire Protection's (CAL FIRE) Mendocino Unit consists of 2,361,560 acres, and CAL FIRE provides direct protection for 2,244,450 acres, 28,145 of which are in southern Trinity County. With the exception of the four incorporated cities of Ukiah, Fort Bragg, Willits, and Point Arena, and small areas of Local Responsibility Area (LRA) lands within Mendocino County, CAL FIRE maintains statutory responsibility for all wildland fires. Of the total County population, about 59,000 or 67% live on State Responsibility Area (SRA) lands.

The Unit is geographically divided into six battalions. The project site is within the area served by the Willits Battalion (Battalion 2). Suppression resources during fire season include 128 career personnel and another 100 seasonal personnel countywide, spread over seven days, on duty around the clock, staffing 10 fire stations, 16 engines, 4 bulldozers, and other equipment throughout the County. A typical engine company consists of one Fire Captain or Fire Apparatus Engineer and two or three firefighters. In addition, ten 15-man California Department of Corrections and Rehabilitation crews, housed at the Chamberlain Creek and Parlin Fork Conservation Camps within Jackson Demonstration State Forest, provide fire fighting, hand line construction, mop-up, and post-fire patrols.

Howard Forest fire station, co-located with Unit Headquarters, is located just to the north of the project site. This station provides the initial ground attack fire protection for Battalion 2. The fire complement of the station consists of two Incident Command System (ICS) Type 3 fire engines plus one reserve Type 3 engine, and a Type 2 bulldozer unit.

A 20-person Helitack Base located at Howard Forest is the home of Copter 101, a Bell UH-1H "Super Huey" which serves multiple purposes, the primary of which is initial attack on wildfires during the fire season. Copter 101's daily staffing is a pilot, two captains, 5-6 firefighters, and a 324-gallon collapsible Bambi bucket for water drops. Full deployment of the helicopter involves dropping off one captain and the firefighters at the fire scene, attaching the bucket for dipping from the nearest accessible water supply

[110] Jeff Smith, Former LLFPD Fire Chief, personal communication, 4/25/07; reconfirmed by Carl Magann, LLFPD Fire Chief, personal communication, 9/2/10.

and, obviously, applying water to the fire. Between 1994-2004, this station has had 100% success in suppressing wildfires in the project area with initial response.

The Unit also includes the Ukiah Air Attack Base which provides 7-day coverage during the daylight hours of peak fire season. Two Grumman S21 turboprop aircraft typically available during this period each have the capacity of 1,200 gallons of fire retardant. Air Attack 110, the Unit's North American Rockwell turboprop OV-10 command plane, carries its pilot and the Air Attack Battalion Chief or captain who coordinates aerial suppression activities from an orbit above the fire.[111]

2. Police Service

Police response to the project site would be provided by the Mendocino County Sheriff's Department. The California Highway Patrol would provide response to accidents on Highway 101.

3. Water and Wastewater

Water is currently supplied to the quarry by its existing well and/or water trucked to the site using water from the applicant's springs or City of Willits water, Porta-potties are used to store wastewater, which is pumped out on a regular basis.

B. Potential Impacts and Mitigation Measures

1. Criteria Used For Determining Impact Significance

Based on the *CEQA Guidelines* and other commonly accepted standards, the project would have a significant impact on fire protection and emergency medical services if it would:

4.8a Generate demand for public services, parks, recreational facilities that would result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives.

4.8b Generate demand for fire protection services that would exceed the ability of the fire department to provide service without substantially decreasing its ability to serve the existing population.

4.8c Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

[111] The data presented above on CAL FIRE was taken from *Mendocino County Community Wildfire Protection Plan*, Mendocino County Fire Chiefs' Association and California Department of Forestry and Fire Protection, 2005.

4.8d 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.

4.8e Generate demand for police services that would exceed the ability of the police department to provide service without substantially decreasing its ability to serve the existing population.

4.8f Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded water entitlements needed.

4.8g Generate additional wastewater that would exceed the existing or planned capacity of the sewage treatment and disposal system.

4.8h Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

4.8i Comply with Federal, State, and local statutes and regulations related to solid waste.

2. Project Impacts

The project would generate nine new jobs. These additional positions would not result in a significant increase in the number of children that would be educated at local schools (Criterion 4.8a). The project would not generate substantial quantities of solid waste, and this waste could be handled by existing solid waste transfer stations and receiving landfills (Criteria 4.8h and 4.8i). The project would not generate demand for any public services, parks, or recreational facilities that would result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives (Criterion 4.8a).

Increased Calls for Fire and Emergency Medical Response

Impact 4.8-A The project would generate increased calls for fire response and emergency medical aid.

LLFPD has stated that the proposed access road needs to be designed and constructed per the District's and CAL FIRE's requirements. The proposed access road complies with the width, surfacing, grade, and turning radius requirements set forth by the fire agencies. The District also requires that all on-site liquid storage tanks (other than water tanks) have approved secondary containment around them. The project has been designed to comply with this requirement, but the final design should be reviewed and approved by LLFPD.

LLFPD requires that the project be supplied with at least 120,000 gallons of water storage in order to provide adequate fireflow for fire suppression. The applicant has

already constructed a 212,000-gallon water tank above the asphalt processing facility site.

Given compliance with District requirements and design recommendations, the District does not believe that the project would have a significant effect on its resources. The District does not expect that the project would generate a substantial number of calls for service. Fire Chief Carl Magann has stated that the quarry does not pose a major concern as regards fire ignitions. The fuels and other materials stored and used on the asphalt processing site would all be contained in double-walled tanks on a paved surface. In the past 33 years, there have not been any significant fires (i.e., beyond a minor ignition like a truck engine or other easily controlled fire) at the three asphalt plants that historically were located in Willits. Chief Magann does not expect that the project would generate any significant calls for service.[112] CAL FIRE also reviewed this discussion and agreed with Chief Magann's conclusions and recommendations.[113] However, the impact would be ***potentially significant*** until final design includes all recommendations and requirements set forth by LLFPD and CAL FIRE.

The applicant has agreed to provide any necessary connections requested by CAL FIRE for use in fire suppression. However, due to the fact that the tank use is primarily for process water storage, the volume of water used for fire suppression is subject to available water on hand at any given time.

Emergency medical response would mainly be to accidents involving access in and out of the project. As described in Section 4.4 (Traffic), while access to and from the quarry is currently a significant safety concern, there have been few traffic accidents on Highway 101 near the quarry. From 2001 through 2008, there were no reported accidents at the Black Bart Drive intersection with the highway. There were two reported accidents at the quarry access road intersection with the highway prior to 2004. One involved an auto using the driveway on a weekend and was not related to quarry activities. One accident was related to the quarry: a northbound truck turning left into the driveway was rear ended by a vehicle traveling northbound on Highway 101. The project includes the addition of a northbound left-turn lane, a southbound deceleration lane, and a northbound refuge area for traffic turning north onto Highway 101. These improvements would improve overall safety at the access driveway intersection with Highway 101. The project would have a ***less-than-significant impact*** on emergency medical response. Also see Section 4.9 regarding risks involving transport of petrochemicals.

Mitigation Measures

The applicant has proposed to incorporate whatever piping or other apparatus is needed to allow fire agency access to the water tank and to provide the second access from Black Bart Drive. The following codifies those proposals and other recommendations.

4.8-A.1 The applicant shall comply with all Little Lake Fire Protection District (LLFPD) requirements, including:

[112] Jeff Smith, 4/25/07; reconfirmed by Carl Magann, 9/2/10.
[113] Larry Grafft, CAL FIRE, personal communication, 5/16/07.

- A sign that complies with LLFPD signage requirements shall be installed at the project entrance.

- Liquid on-site storage tanks (other than water tanks) shall be reviewed and approved by LLFPD. If multiple tanks are placed in close proximity to one another, the spacing between tanks must be reviewed and approved by LLFPD.

- LLFPD shall review and approve the final project design to ensure adequate hydrant location and fireflow to the hydrants.

- LLFPD will approve the size, type, and number of fire extinguishers for the project. Approved spark arrestors must be installed on all internal combustion engines that require them. These items are required during and after construction.

- The water storage tank will be fit with the apparatus that LLFPD and/or CAL FIRE require to be able to access the water in the tank.

4.8-A.2 An emergency-only, gated, and paved access shall be provided from the asphalt processing facility site to Black Bart Drive.

Impact Significance after Mitigation

The above-noted mitigation measures would reduce the chance of a major fire igniting on the project site thereby reducing the impact to the LLFPD and CAL FIRE to a ***less-than-significant*** level. The traffic safety impact is reduced to a ***less-than-significant*** level as described in Impact 4.4-B.

Increased Risk of Wildfire Ignition

Impact 4.8-B The project would increase the risk of igniting wildland fires or being affected by a wildland fire.

As noted in the Setting Section, any fire ignition during the fire season is responded to by numerous engines, firefighters, a bulldozer, a helicopter, and air tankers. The proximity of the project area to the Howard Forest fire station and this aggressive initial attack approach is the reason that the initial attack has been successful in suppressing fire ignitions in the project area. LLFPD states that while it is possible for any development to be the source of a fire ignition, they do not expect that project operations would ignite a fire that would escape the site and spread into surrounding wildland fuels. This conclusion is based on the following: all flammable materials are stored in double-walled tanks; the asphalt plant is designed and operated to prevent escape of materials or unwarranted ignition of materials; asphalt oil is difficult to burn even if it does escape a tank; the tanks will be constructed and sited per LLFPD requirements; the asphalt tanks and diesel tanks are all located on a paved site at least 75 feet from unpaved areas; personnel are trained to respond to fires and spills and fire extinguishers will be located on site as required by LLFPD; spacing of tanks and operations must also undergo

review and approval by OSHA and the Department of Mine Safety; there is no history over the past 30+ years of substantive fire ignitions at asphalt plants in the LLFPD jurisdiction; the proximity to the Howard Forest fire station; more than adequate fireflow; and the initial attack format used by CAL FIRE and LLFPD. Similarly, LLFPD does not believe that a wildfire starting elsewhere in the area would be able to burn onto the project site and cause ignition of fuels, asphalt oil, or other material stored on the site. Again, this is because of the factors listed above as well as the fact that the asphalt processing facility site is not bordered by highly flammable fuels (e.g., chaparral).[114] Therefore, so long as the mitigation measures required for Impact 4.8-A are implemented the impact would be reduced to a ***less-than-significant*** level.

The 212,000-gallon water tank constructed by the applicant provides the only dedicated water storage in the area accessed by Black Bart Drive. Until this tank was constructed, when fighting fires in the area, once the water tender was empty, it needed to be refilled at a hydrant in Willits or at the reservoir on the City's watershed property to the northeast of the site. LLFPD and CAL FIRE can now use water from the newly constructed water tank on the project site to refill its tender and engines. This water storage will improve the ability of fire suppression agencies to control and suppress fires occurring in the Black Bart Drive area.[115]

Because a major fire would not be expected to occur at the asphalt processing facility, the project would not be expected to impede emergency access to residential areas accessed by Black Bart Drive nor would it be expected to block emergency evacuation from those western neighborhoods.[116]

Mitigation Measures

The mitigation measures recommended for Impact 4.8-A also apply to this impact.

Impact Significance After Mitigation

The recommended mitigation measures would reduce the impact of wildland fire ignitions and fire spread to the site to a ***less-than-significant level.*** The provision of fireflow water storage that can be used for other fires in the area is a ***beneficial impact*** of the project.

Increased Demand for Police Response

Impact 4.8-C The project would generate increased calls for police services.

Like any business, the project could result in additional crime, requiring police response. However, this is not a retail business, and crimes typically correlated with retail commercial development would not be expected. Vandalism is a possible crime, but the project will be fitted with security lighting, and this would not be expected to require

[114] Jeff Smith, 4/25/07; reconfirmed by Carl Magann, 9/2/10.
[115] Jeff Smith, 4/25/07; reconfirmed by Carl Magann, 9/2/10.
[116] Jeff Smith, 4/25/07; reconfirmed by Carl Magann, 9/2/10.

substantial response from the Sheriff's Department. The project would not be expected to generate a substantial increase in calls to the Sheriff's Department. The main increase might be for responding to vehicle accidents. However, as discussed in the traffic section, there have been few reported accidents involving haul trucks near the site, and the project would improve the safety of the access driveway's intersection with Highway 101. The project would not generate a substantial increase in calls to respond to accidents. The impact on the Sheriff's Department is considered to be ***less-than-significant*****,** and no mitigation is required.

Increased Demand for Water

Impact 4.8-D The project would generate increased demand for water.

As described in Section 4.2 (E)(12)(a) the existing quarry uses approximately 1,245,000 gallons of water per year (or 3.82 acre-feet per year[117]) for aggregate processing and dust suppression. The project water demand will be a maximum of approximately 2,957,800 (or 9.08 acre-feet per year). The project will increase water demand by 1,712,800 gallons[118] per year (or 5.25 acre-feet per year, or the approximate equivalent of the annual water demand of about 10 new urban residential units).

Water needed for processing aggregate and other water requirements for the project would be supplied by a well on property owned by the applicant. No additional water entitlements are required. The well provides 15 gallons per minute, which is sufficient for processing materials and controlling dust. See the discussion under Impact 4.2-C regarding effects of this increased water usage on neighboring wells.

It is expected that the well would meet all project demands. However, there is always the possibility that under prolonged multi-year drought conditions that the well would not provide sufficient water. If there is insufficient water, then the applicant would be unable to wash aggregate and/or process aggregate, so those elements of the project would either need to be cut back until water again was available at the on-site well or other water conservation methods used to allow sufficient water for dust control and processing. Alternatively, the applicant could purchase adequate water from an off-site source. In the past, the applicant purchased water from the City of Willits. However, City water might not be available for sale in case of a prolonged drought. A lack of water would cause the project to cut back, or even terminate, operations. This would affect the applicant, but it would not be an environmental impact.

Water is also needed for dust control at the quarry. If there is insufficient water available for dust control, quarry operations could generate dust that drifts off the site. This is a ***potentially significant*** secondary impact.

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[117] In areas of Mendocino County served by municipal water systems, the average household uses about 0.5 acre-feet of water per year.

[118] Water demand for the proposed project was described in the report titled: *Potential Impacts of Increased Groundwater Pumping to Supply Proposed Harris Quarry Expansion*, Ludhorff & Scalmanini Consulting Engineers, November 19, 2010. This report is on file for public review at the offices of the Mendocino County Department of Planning and Building Services.

Mitigation Measures

4.8-D.1 The quarry shall cease operations if the applicant cannot provide 7,200 gallons of water per day for dust control. The amount of required water for dust control may be reduced by the Mendocino County Air Quality Management District if it determines that the applicant, using alternative methods of dust control, is preventing dust from drifting off the property.

Impact Significance After Mitigation

The applicant has estimated that 7,200 gallons of water per day are needed for dust control on the driest days. The required mitigation measure ensures that quarry operations would occur only if there is sufficient water to control dust. This measure reduces the impact to a ***less-than-significant*** level.

Need for a New On-Site Wastewater System

Impact 4.8-E If not properly designed and constructed, the new on-site wastewater system could adversely impact water quality.

A new on-site septic system will be constructed to serve the project. Unless this private septic system and leachfield are properly designed and operated, it could result in contamination of surface or groundwater and pose a human health risk. The system will be required to be designed, constructed, and operated in accordance with the Mendocino County Division of Environmental Health's regulations for on-site septic systems Designing and constructing the leachfield system consistent with County requirements would ensure that the system would not pose a health risk or result in environmental degradation. Requiring erosion control and reseeding of the trenching would reduce erosion and sedimentation impacts to a less-than-significant level. Construction of such leachfields is common in the rural parts of Mendocino County. So long as County requirements are met, the impacts of constructing and operating this system would be reduced to a ***less-than-significant*** level.

3. Cumulative Impacts

There are no other proposed projects in the project area. The project demand for increased response from public service providers is so small that it would be a less-than-significant increment of any demand generated by overall population increase in the area or the County. The project would not be a part of any cumulative impact on public service providers. The project would not combine with any possible future expansion of the quarry to result in a cumulative impact on public services.

4.9 HAZARDS AND HAZARDOUS MATERIALS

A. Setting

Explosives are currently used on the quarry. Typically, blasting is done three times per year. No explosives are stored on site. The blasting is done by an independent company who transports the explosives to the site and conducts the blasting.

The nearest school is La Vida Independent Study Charter School located about one mile south of the quarry site.

1. 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). Hazardous materials have been and are commonly used in industrial applications.

A number of potentially hazardous substances are stored on the existing quarry site. Diesel fuel used for quarry operating equipment, including the generator, is currently stored on site in a 10,000-gallon aboveground double-containment storage tank and a 1,000-gallon aboveground tank. The applicant proposes to add a 20,000-gallon double-walled tank for diesel storage for equipment at the asphalt processing facility.

Waste oil is and will be stored in a 500-gallon double containment tank. Other than diesel fuel and waste oil, potentially hazardous substances stored and used on the quarry site consist of various types of lubricants, oils, diesel additives, gasoline, and hydraulic fluids. These will all be stored with double containment protections.

2. Regulatory Framework

a. 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 Department of Toxic Substances Control (DTSC), the North Coast Regional Water Quality Control Board (RWQCB), the California Air Resources Board (CARB), and other offices. The Mendocino Air Quality Management District (MCAQMD) has jurisdiction over the air basin, which includes this area of Mendocino County. Local regulatory agencies include the Mendocino 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 Mendocino County Air Quality Management District

The project site is in the North Coast Air Basin. The California Air Resources Board (CARB) and the Mendocino County Air Quality Management District (MCAQMD) 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. MCAQMD 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 MCAQMD, 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 Division of Environmental Health (the Division) of the Mendocino County Health and Human Services Agency. The Division is 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.

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 (Emergency Response Plan)
- 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 the Division. The hazard communication requirements are enforced by Cal/OSHA.

Worker Health and Safety

Worker health and safety is regulated at the Federal level by the Federal Department of Industrial Relations. Worker health and safety in California is regulated by 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.

B. Potential Impacts and Mitigation Measures

1. Criteria Used For Determining Impact Significance

A project will have a significant impact if it meets any of the following criteria.

4.9a Creates a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

4.9b Creates 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.

4.9c. Emits hazardous emissions or handles hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

4.9d Is 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 create a significant hazard to the public or the environment.

4.9e. 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, would the project result in a safety hazard for people residing or working in the project area.

4.9f For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.

2. Project Impacts

The project would not emit any hazardous emissions within one-quarter mile of a school as the nearest school is over one mile away (Criterion 4.9c). The site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Criterion 4.9d). The site is not within an area under an airport land use plan. It is near the Howard Forest Helitack station, but discussions with CAL FIRE indicated that any impact to use of that station or impact on the project would be less than significant (Criteria 4.9e and 4.9f).

Risk from the Use of Explosives

Impact 4.9-A Transport, storage, and use of explosives pose the risk of an unplanned explosion.

Future mining of the expanded project site would require the continued use of the explosives that are currently used for the project. More explosives would be used if the production rate increased. However, explosives are not stored on the site. While the transport and storage of such explosives pose a potential risk to the public, this impact is

considered to be less than significant given continued compliance by the company who transports the explosives with applicable State laws and regulations governing these explosives. Thus, the impact is considered to be ***less-than-significant***.

Risk from Use of Other Hazardous Materials

Impact 4.9-B Transport, storage, and use of diesel fuels and other chemicals on-site pose a potential safety risk.

For the quarry site, there is an existing an aboveground 10,000-gallon double containment tank for diesel storage for the major mobile equipment and the generator and a 1,000 gallon tank for fueling smaller plant equipment. Waste oil will continue to be stored in a 500-gallon double containment tank. Other than diesel fuel and waste oil, potentially hazardous substances stored and used on the quarry site consist of relatively small amounts of lubricants, oils, diesel additives, gasoline, and hydraulic fluids that are used for mobile equipment. There is a 500-gallon tote container that stores the dust suppressant used on the site. These will all be stored with double containment protections.

Table 4.9-1 lists the various types of chemicals that would be transported, stored, and used for the proposed project. All potentially hazardous materials except fuels and other lubricants contained in trucks and the loader used on site will be stored in double-contained areas, which ensures that if the primary storage tank/facility fails that there is a back-up storage container to prevent escape into the environment.

Table 4.9-1
Hazardous Material That Will Be Stored On-Site

POLLUTANT	DESCRIPTION	STORAGE TYPE	QUANTITY (approx.)
Diesel	#2 diesel fuel	Double walled fuel tanks & lines	20,000 gal. tank 10,000 gal. tank 1,000 gal. tank
Hydraulic Fluid	10 weight	Double Contained	10 gal.
Transmission Fluid	30 weight	Double Contained	10 gal.
Engine Oil	15/40 weight	Double Contained	55 gal.
Grease	EP2	Double Contained	55 gal.
Oil	220 weight	Double Contained	55 gal.
Antifreeze		Double Contained	6 gal.
Compressor Oil		Double Contained	1 gal.
Brake Fluid		Double Contained	1 gal.
Brake Clean		Double Contained	12 cans
Handy Oil	3 in 1	Double Contained	10 gal.
Used Oil		Double Contained	200 gal. 500 gal.
Asphalt Oil	AS8000 / PBA 1A	Double Contained	60,000 gal.
Heating Oil		Double Contained	100 gal.
Bio-Diesel		Double Contained	110 gal.

One 20,000-gallon double-walled tank and hoses/lines will be used for diesel storage to fuel equipment at the asphalt processing facility. This tank will service all of the major mobile equipment in the process area and fuel the A/C burner. This tank will be compliant with State regulations for aboveground double-contained fuel tanks. All maintenance fluids will be stored in a central area; primarily these fluids are stored in a lockable storage/maintenance container. All large tanks/barrels, 55 gallons or greater in size, will be housed with sufficient double containment devices, such as plastic barrel spill containers. Additionally this area will be equipped with spill kits containing absorbent pads and granules for rapid clean-up of minor spills. The used oil tank will be double contained and have a maximum capacity of 200 gallons. This tank will be capped at all times so that rainwater will not be capable of filling and floating out the contents. The contents will be removed and disposed of by a certified removal agency. Copies and records of all removal invoices will be kept in a file with the SWPPP. All containment areas will be designed to hold 110% of the volume of the largest containers.

The transport of diesel fuel, asphalt oil, and other products that are or will be used on the site, such as lubricating oils and solvents, does not pose any more significant problem than typical transport of such materials in the area and the County, except for the risk of a loaded diesel fuel truck turning into the project being involved with a traffic accident. A number of commenters on the original EIR pointed out this increased risk and the possible impact on travelers and residents in the area. This is a potentially significant impact.

Storage of diesel fuel and asphalt oil would be a potential hazard if there was a fire. However, the diesel fueling station would be operated per all County requirements and be located in an area that is not near vegetation nor flammable structures. All flammable materials will be stored per Little Lake Fire Protection District requirements. Thus, there is little risk of a fire igniting the storage tank. Asphalt oil will be delivered on an as needed basis. A minimal amount of asphalt oil is stored on-site when there is no large paving project being constructed. Asphalt oil is typically delivered by the refinery tanker drivers. The unloading of this product occurs within the tanks containment area through 4-inch hoses and heated pumps. Unlike other oils, asphalt oil has a limited ability to leach into the groundwater or travel. Once it is at ambient temperature, it will solidify and not travel.

Bio-diesel is used to allow the asphalt to release from the truck beds without sticking, and help prevent lumping. It is typically received in totes and stored close to the application area.

The hot mix asphalt will be loaded out via a silo surge system. This process works by positioning a truck under the load out area and placing the required mix amount into the truck bed via gravity feed. There are no chemicals discharged or loss of material during this procedure. Once full, the truck pulls out of the loading bay and proceeds to the job site.

The fueling of the plant loader will take place in the fueling area. The area will be graded so no spills can move out of the vicinity. This fueling location is a long distance from the clean-out basins. If fuel or maintenance fluids ever did reach the basins, goose neck outflows would prevent any contaminant from exiting the facility. During fueling the

hoses and fittings will be inspected for leaks. Dry absorbent material/spill pads will be located at the fueling area to mop up any small spills.

There will be small amounts of greases and fluids used to maintain the site equipment. These will be stored in a locked and contained maintenance trailer within this fueling area.

The transport, storage, and use of fuels and other chemicals would not pose a significant health hazard given continued compliance with required permits and plans. As noted in the previous section on Fire and Emergency Medical Response, the LLFPD and CAL FIRE do not consider the project as a significant cause of fires or emergency medical situations. However, the proposed plans must be reviewed and finally approved by the LLFPD, the Mendocino County Division of Environmental Health, and the North Coast RWQCB.

Unless the project is properly designed and hazardous materials properly transported, stored, and used, there is the risk of escape of these materials into the environment with consequent adverse impacts on human health, water quality, and plants and wildlife. This is a ***potentially significant impact.***

Mitigation Measures

As required by law, the project's Stormwater Pollution Prevention Plan will need to be approved by the North Coast RWQCB. The applicant will be required to comply with all provisions of that approved plan. As required by County regulations, a revised Hazardous Materials Business Plan (including an Emergency Response Plan) will need to be reviewed and approved by the Mendocino County Division of Environmental Health. The applicant will be required to abide by all conditions set forth in that plan.

All mitigations required for Impacts 4.1-B, 4.1-C, 4.4-B, 4.4-D, and 4.8-A also apply to this impact. In addition, the following mitigation is required:

4.9-B.1 Trucks transporting diesel fuel will be restricted to turning left into the site no later than 10 a.m. If deliveries occur after 10 a.m., the delivery truck must access the site from the north.

Impact Significance After Mitigation

Compliance with existing and new SWPPPs and Hazardous Materials Business Plans and LLFPD requirements will reduce the chance for a significant spill of hazardous materials into the environment that would harm human health. The recommended mitigation limiting fuel truck left turns to the period with the least traffic on Highway 101, along with other turning restrictions developed for Impact 4.4-D, will reduce the risk of an accident involving these trucks. This mitigation and these plans, along with compliance with existing State and Federal laws and regulations governing the transport, storage, and use of these materials would reduce the risk to human health and environmental degradation to a ***less-than-significant*** level. The potential for spills due to failure of the building pad was assessed and mitigated in Impacts 4.1-B and 4.1-C. The mitigation

measures for Impact 4.1-C ensure that storage facilities are designed and constructed to withstand foreseeable seismic events.

3. Cumulative Impacts

Project use of hazardous materials would not combine with any future use by a future quarry, so there would be no cumulative impacts associated with the project.

4.10 LAND USE

A. Setting

1. Surrounding Land Uses

The property where the project would be developed includes about 323 acres, which are part of a larger approximately 600-acre holding that is owned by Northern Aggregates, Inc. or one or more of its owners. The site is designated Rangeland in the Mendocino County General Plan and is zoned Rangeland (RL160 – 160 acres is the minimum new parcel size). Approximately 23 acres will be mined or developed as part of the project.

Existing land uses in the project site area include open space, rangeland, rural residential development, and Ridgewood Ranch. Adjacent land uses include lands that are all zoned Rangeland except for an area adjacent to Highway 101 immediately north of Black Bart Drive. The following outlines the adjacent land uses:

- To the east of the quarry site is Highway 101. East of the highway is part of the Ridgewood Ranch (owned by the Church of the Golden Rule) and the Northwest Pacific Railroad line and west and southwest facing hillsides vegetated with mixed hardwood forest, chaparral and grassland. This area is open space.

- To the west of the quarry is undeveloped land (approximately 600 acres, including the project site) owned by the applicant. Further west and southwest, there is rural residential development. The nearest residence to the quarry is over 1 mile to the west.

- To the south is undeveloped open space on the Ridgewood Ranch owned by the Church of the Golden Rule. This approximately 5,000-acre ranch is the historic home of Seabiscuit, the famous racehorse. Much of this ranch is being placed in conservation easements to preserve the natural and historic resources on the property. The Church's residential compound is located about one mile south of the quarry. La Vita School is located in this compound. A mobile home park (Golden Rule Mobile Village) is located about 1.75 miles south of the quarry.

- To the north of the quarry site and northeast of the asphalt processing facility site is some roadside commercial development, including 5-6 residential units, an old motel, an old service station that is used as a garage, a mobile home sales office, and a restaurant (not operating). Further north of this area are the California Highway Patrol truck scales. This area is zoned Commercial (C2). Across the highway is the Howard Forest fire station, which is about 2,000 feet northeast of the asphalt processing facility. North of the asphalt processing facility site (and west of the highway commercial area) is open space land owned by the applicant. Further north and northwest are rural residential properties; the property boundary of the nearest rural residential property is about 3,000 feet north of the asphalt processing facility site, with the nearest home located approximately one mile away.

B. Potential Impacts and Mitigations

1. Criteria Used to Determine Impact Significance

A project will typically have a significant impact if it meets any of the following criteria:

4.10a Physically divides an established community.

4.10b Converts 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.

4.10c Conflicts with existing zoning for agricultural use or a Williamson Act contract.

4.10d Involves other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use.

4.10e Displaces substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

4.10f Displaces substantial numbers of people, necessitating the construction of replacement housing elsewhere.

2. Project Impacts

The project would not divide any existing community, and thus have no impact per Criterion 4,10a. The project site does not contain Farmland, and thus would have no effect per Criterion 4.10b. The quarry would neither displace housing nor people, so there would be no impact per Criteria 4.10e and f.

Impacts on Neighboring Agricultural Operations

Impact 4.10-A Project construction and operation could adversely affect agricultural operations in the project area.

The Church of the Golden Rule operates a cow-calf operation (80 pairs) on portions of the 5,000-acre Ridgewood Ranch. The ranch includes Prime Farmland soils in areas of the valley bottom that are used for hay growing, irrigated pasture, an organic garden (also used for ecological research; interns come to study the organic approach used at this garden), and a 2-acre cherry orchard (leased to Butler Cherries). The areas of Prime Farmland are at least one mile distant from the site. The only possible adverse effect that project operations might have on Prime Farmland on Ridgewood Ranch would be from air pollution. There is no evidence that any substantial amount of pollutants generated by the project would drift to and settle on Ranch agricultural property and cause any adverse effects on agricultural products.

As described in previous impact discussions, the project would not cause substantial noise, air quality, or water quality impacts. As such, the project would not affect the qualities of the farmland and rangeland on Ridgewood Ranch. There is no evidence that continued mining of the quarry would adversely affect livestock grazing near the quarry site. The project would have a ***less-than-significant*** impact on Ridgewood Ranch prime agricultural soils and on agricultural operations at that ranch.

Land Use Conflicts with Ridgewood Ranch

Impact 4.10-B Project construction and operation could result in land use conflicts with Ridgewood Ranch.

The Golden Rule Church Association (GRCA) a 501(c)(3) non-profit charitable organization, as the owner of the Ridgewood Ranch, is working with the Seabiscuit Heritage Foundation and the Golden State Land Conservancy to preserve the 5,000-acre Ridgewood Ranch as a working landscape, including expanded educational programs that reflect the cultural heritage and conserve the natural resources of the ranch. In March 2004, the GRCA (with assistance from the Mendocino Land Trust and a grant from the Save-the-Redwoods League) placed a 33-acre conservation easement on the portion of the ranch containing old growth and mature second growth redwoods. In June 2007, the GRCA placed a conservation easement on 1,689 acres of conifer forest, oak woodland, and rangeland with assistance from the Mendocino Land Trust and a grant from the California Wildlife Conservation Board. Funding for additional conservation easements are being pursued by the GRCA to conserve the remaining areas of the ranch. In addition, the GRCA is planning to preserve portions of the ranch in an historic district. In 2003, the National Trust for Historic Preservation identified the ranch as one of the eleven most endangered historic places in the country. If successful, the GRCA will conserve the wildlife habitat, fish streams, agriculture, forestry and history of the ranch forever.

The ranch is the “Home of Seabiscuit”, and the Seabiscuit Heritage Foundation, which is based on the ranch, provides nature walks open to the public 20 days a year to tour the areas under conservation easements. In addition, the Foundation provides historic tours of the ranch from May through October.

The GRCA also sponsors a horse therapy program, TRAIL, for handicapped children on the ranch. TRAIL has about 20 children and their families every week caring for and riding horses in an outdoor setting on the ranch.

There is also a charter school located on the ranch, La Vida School, which serves about 150 students from grades 1-12 who attend on the average of 2 times per week and are also home-schooled during the school year.

There are 250 residences, comprised of apartments, homes and mobile homes, on the ranch and about 450 residents. The main Church complex contains 146 residences, a church, school, historic buildings, dining facility, bathhouse and swimming pool, and numerous barns, garages, and other ranch buildings. The Golden Rule Mobile Home Village, as senior residential development, contains 94 permanent mobile homes, plus a

Recreation Vehicle park for seasonal visitors open Memorial Day through Labor Day. There are also ten other residences on the ranch.

The GRCA conducts sustainable timber harvesting under a Non-Industrial Timber Management Plan that was approved by CAL FIRE in 1998. The GRCA gets much of its water supply from springs in the hills east of Highway 101 and a lake on the north boundary of the ranch. The springs have been deemed "pristine water sources" by the State for drinking water, which allows the GRCA to provide the water to the residents without needing to treat the water first. These springs feed covered reservoirs, and pipes deliver the water to the domestic uses west of the highway. There are about 8 springs feeding two reservoirs. The springs are all beneath the surface of the ground or covered, and the two reservoirs have roofs and solid walls with screened windows open to the outside air. The lake is used as a source of water for agricultural irrigation and recreation.

The EIR preparers toured the ranch with the ranch manager to determine the locations from which the quarry would be visible and to discuss what potential effects the project could have on the Ranch and its residents. The potentially most significant impacts identified by the ranch manager are noise, light from night operations, traffic, air pollution, aesthetics, and sedimentation of Forsythe Creek.

The ranch includes a section of the old Highway 101 (located west of the existing highway); this section ends at the quarry (it extends past the quarry, but this is not part of the ranch property). The quarry operators have an agreement with the Church to store aggregate on the northernmost section of this abandoned road, adjacent to the quarry. In exchange, the quarry provides the Church with aggregate worth approximately $12,000 a year. The Church uses this aggregate for their numerous stream restoration projects on Forsythe and Walker Creeks.

As described in the previous section on Aesthetics (see the previous discussion under Impact 4.7-A), the expanded quarry will be visible from many areas on the ranch, including from the main Church complex. Though the quarry face would be at some distance from most ranch vantage points, it would be noticeable and detract from views from the ranch. There would be a significant and unavoidable impact on views from the ranch, including impacts of night lighting of the processing facilities.

As described in the previous section on noise, heavy equipment operations and blasting at the quarry would continue to be audible at the main Church complex. However, the expansion of the quarry would not increase noise levels. In fact, as the quarry expands, quarry-generated noise would decrease as the equipment moves to the north and west. In Phases 2 and 3, the noise would decrease further since the equipment would be buffered by higher and thicker rims around the quarry floor.

As described under Hydrology, continued excavation of the quarry could cause the release of rock and sediment that could enter the tributary of Forsythe Creek south of the quarry, while runoff from the asphalt processing facility could deposit sediments in Forsythe Creek. However, these impacts can be reduced to a less-than-significant level by implementing EIR-recommended mitigation measures.

The emissions of dust and other pollutants from the quarry and processing facilities would either not have a significant air quality impact, or the impacts can be reduced to a less-than-significant level by mitigations recommended in the air quality section. These emissions would not cause a significant land use conflict with ranch operations.

Though not specifically identified as potentially significant effects by the ranch manager, other individuals residing on the ranch have mentioned concerns that the project could adversely affect weather patterns on the ranch, the water quality of ranch springs, wildlife travel patterns, stream water quality, and other issues. These issues have all been addressed in previous sections of this EIR. It was concluded that project impacts on these resources would not constitute a significant impact (though some impacts require mitigation). These impacts would not be expected to cause a significant effect on the conservation easements or an overall significant effect on the resources subject to the easements. The use of the ranch as a working ranch would not be significantly affected by the project. Existing and future public studies, research, and tours would not be significantly affected by the project.

Residents of the ranch would notice the visual changes, but the changes are sufficiently distant and such a minor part of the long-distance views that it would not constitute a significant land use conflict. Some people responding to the NOP requested that the EIR address project impacts on existing and future recreational use of the Ridgewood Ranch. As discussed above, the only significant impact the project would have on the ranch is the visual impact. This EIR identifies this visual impact as a significant and unavoidable impact, but the impact is not so noticeable that it would substantially affect the experience of people taking tours or otherwise using the ranch for recreational purposes. The quarry face would be one relatively small area of the panoramic series of ridges that surround the ranch. While the quarry may be noticeable to people looking in that direction, this visual change would not have a significant effect on recreational use. The night lighting at the processing facilities on the nights when the asphalt facility was active would be noticeable as a "glow" on the horizon, but this would not be expected to have a significant impact on recreational use.

Other than the already identified visual impacts, the project would not result in any direct impacts on the ranch or its use for recreation or research. The project would not be expected to adversely affect the ability of the Church or the Mendocino Land Trust in securing additional funding needed to place most of the ranch in conservation easements. While there may be residents and visitors who find the change in views and the operations noise annoying, these impacts do not rise to a level where they would alter the use patterns of the ranch. There would not be any additional potentially significant impact not already addressed in earlier sections of this EIR. The project would not result in significant land use conflicts with existing use of Ridgewood Ranch. There is no explicit significance criterion for generalized land use conflicts. The specific impacts that might singly or together comprise such a conflict are addressed in this EIR per the CEQA Guidelines recommended significance criteria. Additionally, such land use conflicts as exist may be considered when the County considers whether the proposed project is consistent with General Plan policy and Zoning Ordinance requirements prior to making a decision on the merits of the project (i.e., whether to approve it or not).

Land Use Conflicts with Ridgewood Subdivision

Impact 4.10-C Development and operation of the asphalt processing facility would cause land use conflicts with residential uses to the west and north.

As was discussed in the section on Aesthetics, the project would have a significant and unavoidable visual impact for area residents as they commute on Black Bart Drive. The processing facilities would have a significant and unavoidable impact on the nighttime environment for travelers on Black Bart Drive and some residents living on the Ridgewood Subdivision. As discussed under Impact 4.5-A, most times when nighttime operations occur, noise generated at the asphalt plant site would not be audible at residences to the west. However, there may be times when existing background noise levels are at the bottom end of the range (e.g., 25 dBA). Then, the asphalt plant would be barely audible outside the residence at night. Because the outdoor noise levels are projected to be 30 dBA or less outside, the noise levels would be substantially below sleep disturbance thresholds inside residences (as building walls further reduce noise emanating from outside sources). While this would not be a significant noise impact, it may not be in character with the rural residential uses in the area. When audible, the noise would sound like very distant road traffic. The asphalt plant will emit various pollutants into the air. However, as discussed in Section 4.6, these emissions would be below the significance levels defined at the Federal, State, and Local levels if the measures identified in this EIR are implemented. Therefore, there would be less-than-significant air quality impacts.

The Ridgewood Subdivision is zoned for Rural Residential use. The County allows mining and processing (but not processing asphalt) in the RR zone with approval of a major use permit. The Zoning Ordinance does not allow industrial uses such as the proposed asphalt facility in either the Rural Residential or the Rangeland zoning districts. This implies that the County has in the past considered the operation of such industrial land uses in rangeland and rural residential areas as incompatible land uses. The visual, noise, and air quality impacts are examples of why such uses are generally not allowed in close proximity to one another. The asphalt processing facility portion of the proposed project would result in potential land use incompatibilities. As evidenced by the comments received from residents in the area, many of these residents consider the asphalt plant as incompatible with their residential use of their properties.

Residents living in units on the west side of Highway 101 immediately north of Black Bart Drive would not be substantively affected by the proposed project (once the construction of the haul road is completed) due to the distance from the quarry and the processing facilities and topographic shielding, plus the fact that these residences front Highway 101 and are not rural residential development, and they are already exposed to significant noise and visual effects.

As noted in the previous impact discussion, there is no significance criterion for general land use compatibility. However, the information presented here is provided to ensure that the public and decision-makers have access to all possible substantial effects of the project. The visual impact has previously been identified as a significant and unavoidable impact. See the discussion in Section 4.13 below where this potential land

use incompatibility is discussed in terms of consistency with General Plan and Zoning Ordinance policies and guidelines.

3. Cumulative Impacts

Cumulative Impacts on Land Use

Impact 4.10-D Development and operation of processing facilities at other quarries in the County that would be allowed by the proposed Mineral Processing Combining District could have significant environmental impacts.

The applicant has proposed a new Mineral Processing Combining District that could apply to properties with mineral resources that are zoned Rangeland. This new district would establish a height limit of 75 feet for asphalt silos and other mineral processing equipment. Such processing facilities would be allowed only within 0.5 miles of a mine with vested rights or a mine operating under a County permit. Properties that are under a Williamson Act contract would not be eligible for rezoning. The combining district zoning would cease once active mining of the site ceases. Therefore, the mineral processing is necessarily linked to active mining of a mine site. Any future applicant who wishes to have his/her mining property rezoned into this combining district would need approval by the County Planning Commission and the Board of Supervisors. This would be a discretionary approval that would require CEQA review for each rezoning request.

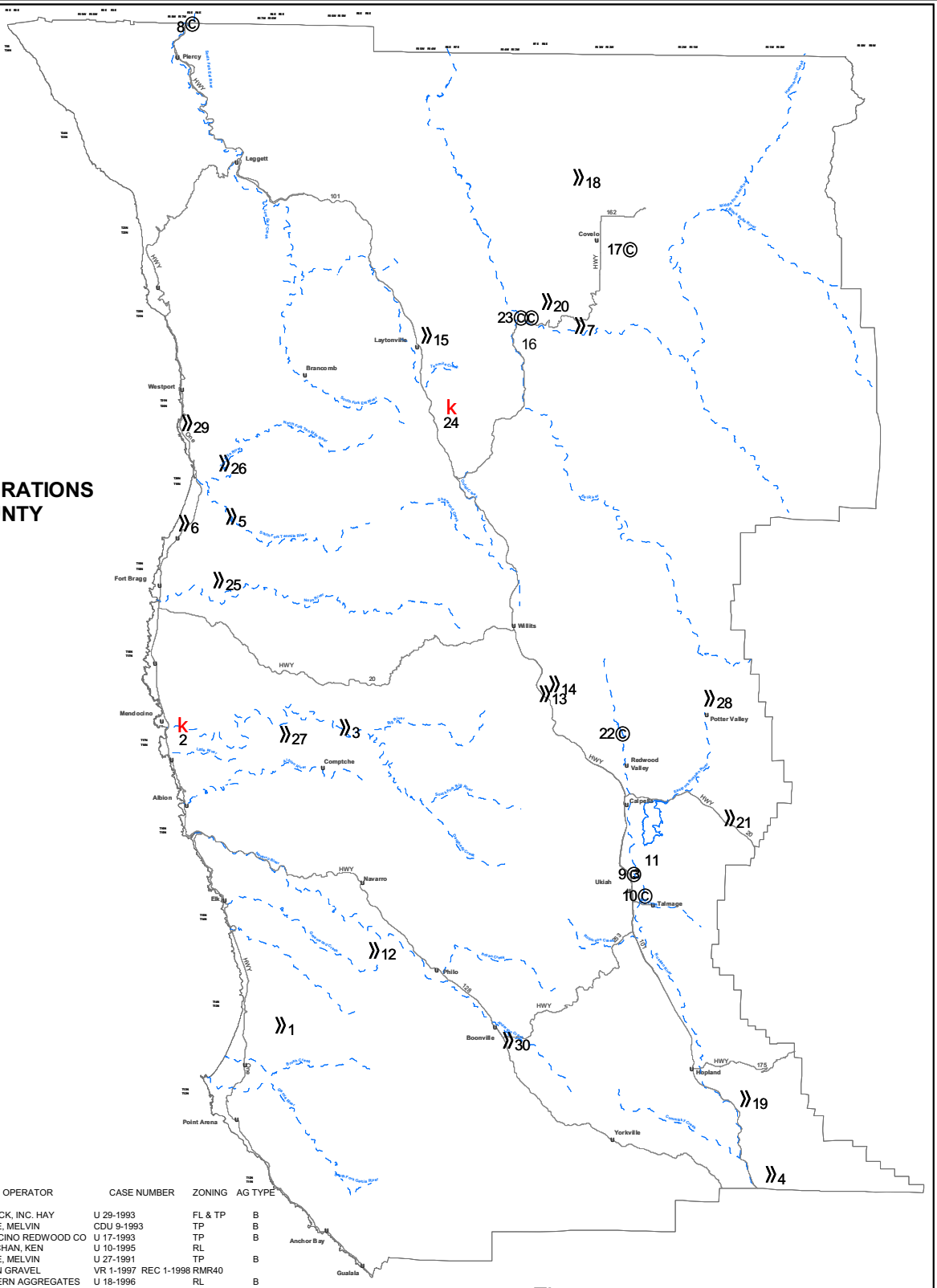
The County's list of active quarries was reviewed to determine which quarries were located in this zoning classification. As shown on Figure 4.10-1, there are 28 surface mining operations (four of which are closed or are being reclaimed and two that are idle or pending renewal); in addition an applicant has filed an application to develop a new quarry site in the Covelo area (Grist Creek Aggregates – not shown on the map, zoned Agriculture). Of these 28 operations and 1 application, 9 quarries are zoned Rangeland; they are:

Blue Ridge Rock Quarry is located east of Highway 101 near the Sonoma County/Mendocino County border (just north of Cloverdale). The quarry has a permit that expires in 2016, which allows a maximum extraction of 75,000 cubic yards per year. The property is not under a Williamson Act contract.

Coal Mine Quarry is located south of Highway 162 and south of Covelo and north of the Middle Fork of the Eel River. The quarry has a permit that expires in 2017, which allows a maximum extraction of 25,000 cubic yards of aggregate per year. This quarry is on a property that is under a Williamson Act contract.

Mackenzie Bar is an in-stream aggregate operation located on the Middle Fork of the Eel River at Dos Rios. The quarry has a permit that expires in 2014, which allows a maximum extraction of 30,000 cubic yards per year. The property is under a Williamson Act contract.

SURFACE MINING OPERATIONS
MENDOCINO COUNTY



Quarry Mining Operation Sites
Instream Mining Operation Sites
3 Off Channel Mining Operation Sites
k Closed Mining Operation Sites
Cities & Towns
Highways
Major Rivers

MINE #	MINE NAME	OPERATOR	CASE NUMBER	ZONING	AG TYPE
1	BALD HILLS QUARRY	BED ROCK, INC. HAY	U 29-1993	FL & TP	B
2	BIG RIVER ROCK CO.	PYORRE, MELVIN	CDU 9-1993	TP	B
3	BIG RIVER -7 MILE QUARRY	MENDOCINO REDWOOD CO	U 17-1993	TP	B
4	BLUE RIDGE ROCK QUARRY	McCUTCHAN, KEN	U 10-1995	RL	
5	CAMP 5 PIT	PYORRE, MELVIN	U 27-1991	TP	B
6	CLEONE SAND PIT	BAXMAN GRAVEL	VR 1-1997 REC 1-1998	RMR40	
7	COAL MINE QUARRY	NORTHERN AGGREGATES	U 18-1996	RL	B
8	COOKS VALLEY BARS	MERCER, FRASER CO.	UR 12-1988/2000	FL	
9	FORD GRAVEL	GRANITE CONSTRUCTION	REC 1-1983	AG	
10	FORD GRAVEL	GRANITE CONSTRUCTION	REC 1-1983	AG	
11	FORD GRAVEL	GRANITE CONSTRUCTION	REC 1-1983	AG40	
12	GREENWOOD AGGREGATES	BIRD, ROBIN	U 19-2003	TP	B
13	HARRIS QUARRY	NORTHERN AGGREGATES	UR 19-1983/1995	RL	
14	LAUGHLIN RIDGE QUARRY	GRANITE CONSTRUCTION	U 9-1996	OS	
15	LAYTONVILLE ROCK QUARRY	STUDEBAKER, SHAWN	U 15-1992	UR20	
16	MACKENZIE BAR	GARMON CONSTRUCTION	UR 12-1992/2003	RL	B
17	MILL CREEK BAR/DOBIE LANE	POLSLEY, RAYMOND	UR 13-19983/2004	AG	A
18	PERRY RIDGE QUARRY	FISHER, JIM & HART, FRED	U 19-1999	RL	
19	PIETA QUARRY	NORTHERN AGGREGATES	UM 28-1986/1987	RL	B
20	POONKINNEY AGRICULTURAL ROCK	WILLIAMS, CLYDE	U 6-2000	RL	
21	RED ROCK QUARRY	GRANITE CONSTRUCTION	UR 19-1984/1993	UR40	
22	REDWOOD VALLEY GRAVEL PROD.	FORD, MELVIEN	AA 4-1990/REC 1-1991	AG	
23	ROWLAND BAR	GRANITE CONSTRUCTION	UR 71-1977/1998/2004	RMR40	
24	SHAMROCK QUARRY	PARNUM PAVING, INC.	U 18-1990	RL	B
25	SHERWOOD ROAD PIT	BAXMAN GRAVEL	U 9-1992	TP	B
26	TEN MILE 2ND CROSSING	BAXMAN GRAVEL	CDU 8-1992/VR 1-1994	TP	B
27	TUNZI QUARRY	TUNZI, LARRY	U 46-1991	RL	B
28	WARBONNET QUARRY	OBERFELD, LAURA	UR 21-1981/1996	RL	
29	WILSEY RANCH QUARRY	McMAHON, RONELLE & KIBESILLAH ROCK CO	CDU 7-1994/2000/2006	FL & RL	
30	JOHNSON QUARRY	PARDINI, BOB	U 31-2004	RL	B

Figure 5-1
Location of Aggregate Operations in the County

Source: Map prepared by the Department of Planning & Building Services - Cartographic Section, May 2005.
Data was extracted from Department of Planning & Building Services files.

This map is provided as a visual display of County Information.
Reasonable effort has been made to ensure the accuracy of the map and data provided: nevertheless, some information may not be accurate.
The positional accuracy of the data is approximate and not intended to represent map accuracy from a published record of survey.
THE MAPS AND ASSOCIATED DATA ARE PROVIDED WITHOUT WARRANT OF ANY KIND.
Either expressed or implied, including but not limited to, the impelled warranties of merchantability and fitness for a particular purpose.
Do not make a business decision based on these data without first validating the information with appropriate County agency or other government entity.

2 1 0 2 Miles

Perry Ridge Quarry is located north of Covelo. The quarry has a permit that expires in 2015, which allows a maximum extraction of 20,000 cubic yards of aggregate per year. There is not a Williamson Act contract on this property.

Pieta Quarry is located east of Highway 101 and south of Hopland. The quarry has a permit that expires in 2012, which allows a maximum extraction of 50,000 cubic yards of aggregate per year. This quarry is on a property that is under a Williamson Act contract. In addition, the aggregate supply at this quarry is nearly exhausted, and reclamation has begun.

Poonkinney Ridge Quarry is located off of Poonkinney Road west of Covelo. This quarry has a permit that expired in June 2006, which allowed a maximum extraction of 12,500 cubic yards per year. The quarry is currently being reclaimed. The property is not under a Williamson Act contract.

Tunzi Quarry is located north of the Comptche-Ukiah Road and northwest of Comptche. The quarry has a permit that expires in 2012, which allows a maximum extraction of 8,000 cubic yards of aggregate per year. This quarry is on a property that is under a Williamson Act contract.

Johnson Quarry is located near the junction of Highways 128 and 253, south of Boonville. The quarry has a permit that expires in 2025, which allows an average extraction of 15,000 cubic yards per year and a maximum extraction of 20,000 cubic yards of aggregate per year. This quarry is on a property that is under a Williamson Act contract.

Warbonnet Quarry is located off Eel River Road in Potter Valley. The quarry has a permit that expired in 2006, which allows a maximum extraction of 25,000 cubic yards of aggregate per year. The permit has expired, and the site is being reclaimed. This quarry is on a property that is not under a Williamson Act contract. For purposes of this EIR, this quarry is considered inactive and in a state of reclamation.

Only four of these quarries meet the criteria of having Rangeland zoning and not being under a Williamson Act contract, and one of these (Warbonnet) is no longer active. Generally, it takes 9 years for the owner of a site under a Williamson Act contract to be able to terminate that agreement.[119] There are other factors that could influence future development of processing facilities at any of these four quarries, namely:

1. Of the three active quarries, two quarries (Perry Ridge and Poonkinney) have access constraints and/or are distant from urbanized areas. Material processors

[119] There are provisions for canceling a Williamson Act contract sooner than 10 years. The County would need to make explicit findings as to why the contract was being cancelled, including that other public concerns outweigh the objectives of the Williamson Act, and that that there is no proximate, non-contracted land which is both available and suitable for the proposed use, or, that development of the contracted land would provide more contiguous patterns of urban development. See Government Code §51280 et seq. For purposes of this EIR, it is speculative that owners of quarries where there is a Williamson Act contract would desire to apply for a rezoning to the Mineral Processing Combining District and consequently seek the approvals needed to reduce the 10-year termination period for cancellation of the contract.

compete with other processors. If an asphalt processing facility is a lengthy drive to potential markets, particularly if there are other processors who are located closer to those markets, it is less likely that an operator will seek to invest the capital needed to construct processing facilities. For example, it is unlikely that operators would construct processing facilities, particularly asphalt plants, at quarries in the Covelo area. The Blue Ridge Rock Quarry is near Highway 101 and could be used to deliver aggregate to the Highway 101 corridor.

2. Two of the three quarries have limited production capacity. Other than Blue Ridge Rock Quarry, none of the quarries is allowed to produce more than 20,000 cubic yards of material per year. This limited production capacity makes it unlikely that the operator would invest in the cost of an asphalt plant.

3. Blue Ridge Rock Quarry would seem the most likely quarry that might be developed with an asphalt processing facility. However, this site is located between existing asphalt producers in Ukiah and Cloverdale.

4. If Williamson Act contracts were terminated for any of the other five quarries, they also have access and size constraints. The only quarry with reasonable access to markets and road access would be Pieta Quarry. This quarry is leased by the same group that owns Harris Quarry. However, the aggregate supply at this quarry is nearly exhausted, and reclamation has been initiated.

It is speculative that the owners of any of these three active quarries that meet the criteria for possible development of an asphalt plant would seek rezoning to the new Mineral Processing Combining District. As noted above, there are substantial constraints on all these quarries. It would also be speculative to attempt to identify the specific environmental impacts that might occur if an asphalt plant were constructed at any one of these quarries because it is unknown what might be proposed or where in relation to the quarry it would be located. Despite the speculative nature of the impacts, the following range of potentially significant impacts might occur at any one of these quarries. Please note that these impacts are approximately the same impacts predicted for the Harris Quarry. The previous sections provide details about these impacts, and the following summarizes the range of possible impacts.

- Grading of the site would produce bared earth subject to erosion. Eroded soil could adversely affect the water quality of streams in the area, thereby adversely affecting salmonids, other fish, and other wildlife dependent on that water quality. Usually erosion impacts can be controlled by applying appropriate best management practices (BMPs). However, sites near streamcourses could have adverse effects.

- Improper grading of the asphalt processing site could result in soil failure and/or landsliding. This could be a hazard to health and to water quality (from soils entering stream channels). Typically, landsliding can be avoided or controlled by complying with the design recommendations prepared by a geotechnical expert. However, there is the chance of improper design or for earthquake-generated landsliding.

- Improper transport, storage, and use of petroleum products and other chemicals and materials used in asphalt processing could result in hazards to health of workers and

nearby residents and pollution of streams, thereby adversely affecting fish and wildlife living in or near those streams. These impacts are typically mitigated by requiring proper site design and spill containment procedures. However, the risk of accident during transport and or on-site use does exist. This would be particularly problematic where transport routes are located adjacent to streams.

- Earthquakes could cause release of these hazardous chemicals and materials if they are not properly stored. Again, this impact can typically be mitigated by proper design and operations, but the risk would remain.

- Runoff from the asphalt processing facility site could exceed the ability of the drainage system and cause downstream flooding. The CEQA study for each future project would need to identify the site drainage to determine flooding impact. This impact can be mitigated by requiring that additional runoff generated by the project be retained on site and released after the peak runoff has ended.

- Development of the asphalt processing site could adversely affect sensitive biological resources, including special status species of plants and animals, riparian habitat, wetlands, and other sensitive plant communities. Wildlife migration and travel routes could be blocked or disrupted. Nest and nursery sites could be destroyed. Foraging habitat could be lost. Any of these biological impacts are possible. They would need to be identified and assessed once a project was defined for a particular site.

- Cultural resources could be damaged or destroyed when developing the asphalt processing site. Again, once a site is proposed, a cultural resources analysis would need to be conducted.

- Heavy truck traffic would increase on roads serving the asphalt processing site. This increased truck traffic could cause safety concerns on narrow rural roads and State highways. Processing facilities at the two aggregate operations near Covelo would adversely affect traffic on Highway 162 and Poonkinney Road. An asphalt processing facility at Blue Ridge Rock Quarry would not be expected to cause significant traffic impacts.

- The increased truck traffic would emit pollutants into the air, which could adversely affect the health of residents living near the haul routes. This could be especially true for Warbonnet Quarry, where haul traffic would travel through residential areas in Potter Valley and Calpella.

- The emissions from the asphalt plant could adversely affect the health of residents living near or downwind of the asphalt plant. These residents may also be adversely affected by odors from that plant. Emissions could exacerbate global climate change.

- Residents living near the processing facilities could be adversely affected by noise generated by haul trucks or the processing facilities.

- The processing facilities could be visible from public vantage points or private residences. The change in views could be adverse for most residents and drivers.

- The processing facilities could be the site of fires and accidents, requiring additional response from fire protection districts, CAL FIRE, and emergency medical responders.

- The processing facilities could cause wildland fire ignitions.

- The processing facilities could develop wells or springs to provide the necessary processing water. This could adversely affect groundwater and surface water flows, thereby adversely affecting existing wells and springs in the area, and reducing flows in streams.

- Development of the processing facilities could displace commercial agricultural uses and prime agricultural soils. The processing could interfere with adjacent agricultural operations.

- The noise, air emissions, traffic, and view changes could adversely affect recreational use of adjacent lands and/or public lands.

- The facilities could result in nuisance and conflicts with residents of adjacent and nearby lands.

The degree of impact for each of these categories and whether there might be additional site-specific and project-specific impacts would need to be identified and assessed in the CEQA document that would need to be prepared before the County could consider rezoning any quarry property into this new combining district. The County Planning Commission and Board of Supervisors would have the authority to not approve the rezoning if it had unacceptable environmental impacts.

To conclude, there are only three other active quarries (and one of these, Poonkinney, is currently idle awaiting new studies before a permit renewal can be considered) in the County that are potentially eligible to develop processing facilities. It is unknown whether the owners of these three quarries would in the future seek to rezone to this proposed Mineral Processing Combining District, particularly given the size and location of the quarries. It is speculative that the owners of the other five quarries that are designated Rangeland would allow their Williamson Act contracts to expire in order to seek a rezoning and develop processing facilities, and, even if this were to occur, all but one of these quarries is constrained by the allowable production rate or the location of the quarry. It is speculative what the specific environmental impacts would be if an application to develop processing facilities was submitted for any of these quarries. Those impacts would need to be assessed in the CEQA study that would be required before the County could take action on the application. The County would then weigh the merits of the project against the environmental impacts. Because the potential impacts are ***speculative*****,** no mitigation can be identified beyond the CEQA study that is already required for any future application.

Based on the factors discussed above, it is concluded that development of processing facilities at quarries in the Rangeland classification would be very unlikely except possibly for Blue Ridge Quarry. Blue Ridge Quarry is in a relatively undeveloped area

immediately east of Highway 101. See further discussion of the possibility of developing processing facilities at this quarry in the Discussion of Alternative 8 in Section 5.2.

4.11 ENERGY USE

A. Setting

The existing quarry operates using a 2,012-horsepower generator with an EPA Tier 2 engine equipped with a California Air Resources Board Verified Level-3 diesel particulate matter filter. There are also two other smaller generators (22 and 30 horsepower) used to power a well pump and operate the scale shack. The large generator is used for approximately 1,200 hours per year; in the summer it is used about 8 hours per day. Energy is also used by trucks to haul aggregate.

B. Potential Impacts and Mitigation Measures

1. Criteria Used For Determining Impact Significance

A project will typically have a significant impact related to energy consumption if it would:

3.11a Generate demand for energy services that would result in the need for new or physically altered facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or other performance objectives.

3.11b Generate demand for energy services that would exceed the ability of the service provider to provide service without substantially decreasing its ability to serve the existing population.

2. Project Impacts

The asphalt plant electrical equipment will operate using electricity supplied by PG&E. As discussed in Section 4.6, the estimated electricity use for the plant is about 2.6 kilowatt per hour (kW-hr) per ton of asphalt produced, or about 390,000 kW-hr per year. Since natural gas is not available at the site, the asphalt drum mixer dryer and hot oil heater would be fueled with diesel fuel. At the maximum asphalt production rate of 300 tons per hour (TPH) the dryer burner would consume approximately 547 gallons per hour, and the hot oil heater will consume about 9 gallons per hour. The hot oil heater would typically be operated 24 hours per day. Thus, at the maximum asphalt production of 3,000 tons per day, the maximum daily diesel fuel consumption would be about 5,690 gallons.

The existing generators at the quarry site would provide adequate power to the quarry at the proposed production rate. However, in order to reduce the use of on-site generated power, the applicant has requested PG&E to extend an electrical power line from Black Bart Drive to the quarry site. The applicant has requested a 12KV line, but can utilize an A10 Primary service, which will allow them to use machinery that totals 670 horsepower. This would allow the applicant to power the scales, well pump, and some other existing equipment. The existing 2,012-horsepower generator would be used when more energy is required.

Temporary Increase in Energy Consumption Due to Construction

Impact 4.11-A Construction of the proposed project would use electricity, gas, and diesel fuel, but this energy demand would not result in the need for new or altered facilities or exceed the capacity of PG&E.

The project would involve grading and construction of building pads, roads and processing improvements. These construction activities would require the use of gasoline, diesel fuel, other fuels, and electricity.

Energy consumption associated with construction activities is expected to be minimal, compared to energy consumed in the County, and is not anticipated to result in local energy demand exceeding the capacity of PG&E and gasoline/diesel fuel suppliers. Construction activities are not anticipated to result in an inefficient use of energy because construction contractors would supply their own gasoline and diesel fuel and would conserve the use of their supplies to minimize costs to the project. For these reasons and because of the temporary nature of construction activities, this effect would be a ***less-than-significant impact.***

Potential for Long-Term Increases in Energy Consumption

Impact 4.11-B Future operation of the project would require relatively substantial use of energy, but this energy demand would not result in the need for new or altered facilities or exceed the capacity of PG&E's ability to provide service.

Mining, processing, and hauling the aggregate will use extensive amounts of electricity, diesel fuel, and gasoline. The asphalt plant will likewise require substantial use of these energy sources as well (e.g., up to 556 gallons of diesel fuel per hour just to operate the asphalt dryer burner and hot oil heater). Mining and processing of aggregate-based materials is an energy-intensive industrial process. However, if these products were not produced at this location, they would be produced at other area quarries and processing facilities. The project meets a demand of the area population. Also, there is no evidence that PG&E or petroleum producers would need to construct new facilities to meet the project's energy demand, except for the extension of a powerlines from Black Bart Drive to the quarry site. It is expected that this line would follow the new access road for most of its length, so its construction would not be expected to have any significant effects.

By centralizing aggregate production and asphalt plant on one site, the project reduces the overall number of trips in the region related to production of asphalt. This would reduce transport energy demands.

Given the rising energy costs, it is expected that quarry operators and haul truck operators will use energy efficient equipment, so it is not expected that the project would result in inefficient energy use. The project proposes a modern asphalt facility that

would be more energy efficient than older plants currently providing asphalt to the general area.

The project would have ***less-than-significant impacts*** on energy. However, the heavy use of these energy sources will generate emissions of pollutants, including greenhouse gases. These secondary impacts of energy use were assessed above in Section 4.6 (Air Quality).

3. Cumulative Impacts

Future operation of the quarry would also use energy. But the project would be terminated prior to this future use occurring, so it would not be an increment of that future impact.

4.12 CULTURAL RESOURCES

An archaeological survey and study has been done for the site, and no archaeological or historic resources were identified. The report is on file with the County Department of Planning and Building Services. The County's Archeological Commission has reviewed and accepted this study, which states that additional archaeological field study is not required for this site.[120] There is no record of significant paleontological resources near the project site.

In reviewing the original DEIR, the State Native American Heritage Commission recommended that 11 individuals in 7 tribes/bands/nations be contacted to see if they were aware of any cultural resources on the site. Representatives of the Potter Valley Tribe, Pinoleville Pomo Nation, Laytonville Rancheria/Cahto Indian Tribe, Sherwood Valley Rancheria of Pomo, Noyo River Indian Community, She Bel Na Band of Pomo Indians, and a representative of the Coast Miwok and Pomo were sent letters requesting that they identify any resources or concerns associated with the project. No responses were received from any of these representatives.

Impact 4.12-A Future development of the site could damage cultural resources.

While it is unlikely that currently unknown cultural or paleontological resources would be uncovered during site preparation or future mining, there is always that possibility. Damage of these resources would be a ***potentially significant impact.***

Mitigation Measures

4.12-A.1 If cultural resources are discovered on the site during construction activities, all earthmoving activity in the area of impact shall be halted until the applicant retains the services of a qualified archaeological consultant who shall examine the findings, assess their significance, and develop proposals for any procedures deemed appropriate to further investigate and/or mitigate adverse impacts to those resources. The applicant shall abide by the recommended proposals.

4.12-A.2 In the event that human skeletal remains are discovered, work shall be discontinued in the area of the discovery and the County Coroner shall be contacted. If skeletal remains are found to be prehistoric Native American remains, the Coroner shall call the Native American Heritage Commission within 24 hours. The Commission will identify the person(s) it believes to be the "Most Likely Descendant" of the deceased Native American. The Most Likely Descendant would be responsible for recommending the disposition and treatment of the remains. The Most Likely Descendant may make recommendations to the landowner or the person responsible for the excavation/grading work for means of treating or disposing of the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.

[120] Archaeological Commission Action Sheet dated 7/13/05.

4.12-A.3 If any paleontological resources are discovered, 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 can then be made regarding the finds, and a management plan consistent with CEQA cultural resources management requirements shall be adopted.

Impact Significance After Mitigation

These standard mitigation measures ensure that any cultural or paleontological resources that may be found on the site will be treated in a fashion to avoid adverse effects to them. The measures would reduce the impact to a ***less-than-significant*** level.

4.13 PLAN CONSISTENCY

1. Introduction

The following section of the EIR discusses the proposed project's consistency with relevant public plans and policies. This discussion of plan consistency is provided at the request of the County. Inconsistencies with plans are not environmental impacts, since determination of inconsistencies with General Plan or other plan policies is legal in nature and not an environmental impact (since a plan is not a part of the physical environment). However, inconsistencies or potential inconsistencies with plan policies can point to potentially significant impacts on the environment. Where such inconsistencies are noted in this section, the analyses in previous sections of Chapter 4.0 reviewed these inconsistencies in determining the significance of impacts.

It is not within the purview of a Draft EIR to make final determinations of General Plan consistency, as such determinations are "quasi-legislative" in nature (see *Corona-Norco Unified School District v. City of Corona* (1993) 17 Cal. App. 4th 985,992) and require the County to evaluate whether, "considering all [the project's] aspects, it will further the objectives and policies of the general plan and not obstruct their attainment," *(Id*. at 99). Perfect conformity with the General Plan is not required, (Sequoyah Hills Homeowners Assn. v. City of Oakland (1993) 23 Cal. App. 4th 704, 717-718). Rather,

> [a] general plan must try to accomplish a wide range of competing interests – including those of developers, neighboring homeowners, [...], environmentalists, […], and providers and recipients of all types of city-provided services. […] Once a general plan is in place, it is the province of elected city officials to examine the specifics of a proposed project to determine whether it would be "in harmony" with the policies stated in the plan. *Id*.

Therefore, the following is the EIR preparers' assessment of policy consistency. The policy conformance evaluation focuses on the County General Plan and the Zoning Ordinance. The discussions of consistency are based on the impact analyses developed in previous sections of this Chapter. To avoid unneeded repetition of impact assessments, only the conclusions of the previous analyses are used in this section to determine plan consistency. The consistency analysis provided below cites the pertinent section where the impact analysis is found.

To assess consistency, the following discussion uses the terms *consistent*, *inconsistent* and *unknown*. Each of these terms is defined below:

- *Consistent* is used when the proposed project would comply with all the requirements of the relevant policy or regulation.

- *Inconsistent* is used when the project would or may conflict with any part of the policy or regulation.

- *Unknown* is used when it is not possible to make a determination either because of the lack of clarity about the policy intent or for other reasons, as explained.

The preparers of this EIR have included a discussion of project consistency only for those policies or requirements where the EIR preparers concluded that there was a question of possible consistency. To reduce the length of this document and consistent with direction from County staff, this chapter does not assess the project consistency with every policy or standard included in the documents. The EIR also does not address consistency with goals, since goals are general statements, while policies provide the specific conditions for how the goals will be attained.

In all cases, the consistency analysis includes implementation of EIR-recommended mitigation measures. This analysis assesses consistency of 1) the quarry expansion and construction and operation of the processing facilities, and 2) the proposed Mineral Processing Combining District.

2. Mendocino County General Plan

The following policies are pertinent to the project:

a. Development Element

Policy DE-1 To the extent possible, future growth in Mendocino County should be accommodated in the cities, the cities' spheres of influence, and in unincorporated communities with the infrastructure and service capacity to support growth. Future growth should be encouraged on infill parcels and areas contiguous to existing development.

Inconsistent. The policy would not apply to the quarry portion of the project. The proposed asphalt facility on the site would be located outside cities and unincorporated communities. However, public infrastructure is not needed to "support" this project (see Section 4.8, Public Services and Utilities). Since the County has no authority to determine what future land uses should occur in incorporated cities, this policy indicates that the asphalt plant would be located in the unincorporated spheres of influence around the cities or unincorporated communities.

Policy DE-17 Land Use Category: RL-Range Lands
Intent: The Range Lands classification is intended to be applied to lands which are suited for and are appropriately retained- for the grazing of livestock. The classification should include land eligible for incorporation into Type II agricultural preserves, other lands generally in range use, intermixed smaller parcels and other contiguous lands, the inclusion of which is necessary for the protection and efficient management of range lands. The policy of the County and the intent of this classification shall be to protect these lands from the pressures of development and preserve them for future use as designated.
General Uses: Residential uses, agricultural uses, forestry, cottage industries, residential clustering, uses determined to be related to and compatible with ranching, conservation, processing and development of natural resources, recreation, utility installations.
Minimum Parcel Size: One hundred sixty acres.
Maximum Dwelling Density: One dwelling per 160 acres, County review and approval required for more than one dwelling per legally created parcel.

Consistent. Processing of aggregate to prepare asphalt appears to be a use that is compatible with "processing and development of natural resources." However, the County Board of Supervisors will need to make the final determination regarding this compatibility requirement.

Policy DE-57 Locate and design industrial sites and uses in a manner that protects natural resources and minimizes environmental degradation and risk from natural or manmade hazards.

Inconsistent. The asphalt processing facility would result in significant environmental impacts to aesthetic resources (see the four impacts in Section 4.7, Aesthetics) and air quality from transport vehicle emissions of nitric oxide (NO) and nitrogen dioxide (NO_2). However, most impacts can be reduced to a less-than-significant level (which would be consistent with the requirement to "minimize" environmental degradation).

Policy DE-63 Oppose development that undermines agricultural and timber-based operations.

Consistent. The project would not affect significantly distant agricultural uses nor timber-based operations in the region (see Impacts 4.10-A and B).

Policy DE-85 Viewshed preservation shall be considered when development is located in a highly scenic environment, adjacent to or atop a ridgeline or hill, and in similar settings.

Inconsistent. The project would have significant adverse visual impacts (see the four impacts in Section 4.7, Aesthetics).

Policy DE-89 Reduce excessive artificial light and offsite light impacts while maintaining nighttime safety, security, and productivity.

Consistent. Though the project would add new lighting to the asphalt processing facility area, the impact would be reduced to a level that is considered consistent with this policy by implementing EIR-recommended mitigations (see Impact 4.7-D).

Policy DE-128 Ensure that transportation infrastructure accommodates the safety and mobility of motorists, pedestrians, bicyclists, and persons in wheelchairs.

Consistent. The project would improve the existing safety hazards at and near the project's access to Highway 101. Though some hazard would remain due to the increased use of the driveway and possible vehicle conflicts with drivers attempting to turn left into Black Bart Drive and for turns in and out during periods of limited visibility, the recommended improvements to Highway 101 provide more safety benefits than these remaining effects (see Impacts 4.4-B through D).

Policy DE-190 Development of residential, commercial, or industrial uses shall be supported by water supply and wastewater treatment systems adequate to serve the long-term needs of the intended density, intensity, and use.

Consistent. The project will be supplied with sufficient water and wastewater capacity to serve its requirements (see Impacts 4.8-D and E).

b. Resource Management Element

Policy RM-6 Promote sustainable management and conservation of the county's water resources.

Consistent. Hydrologic studies done for the project and reviewed in this EIR indicate that groundwater used for the project would not significantly adversely affect existing wells and springs (see Impact 4.2- C).

Policy RM-24 Protect the county's natural landscapes by restricting conversion and fragmentation of timberlands, oak woodlands, stream corridors, farmlands, and other natural environments.

Policy RM-25 Prevent fragmentation and loss of our oak woodlands, forests, and wildlands and preserve the economic and ecological values and benefits.

Consistent. If interpreted strictly to prohibit and loss of oak woodland or forestland, the project would be inconsistent with these two similar policies. However, even though the project will result in loss of some oak woodland and other forestland, the EIR includes mitigation measures that offset this loss (see Impact 4.3-E). In addition, after 30 years much of the disturbed portion of the site will be restored to oak woodland and forest. Policy RM-28 below provides a clearer description of the County's intention about protecting these resources and mitigations that are acceptable if these resources are adversely affected.

Policy RM-28 All discretionary public and private projects that identify special-status species in a biological resources evaluation (where natural conditions of the site suggest the potential presence of special-status species) shall avoid impacts to special-status species and their habitat to the maximum extent feasible. Where impacts cannot be avoided, projects shall include the implementation of site-specific or project-specific effective mitigation strategies developed by a qualified professional in consultation with state or federal resource agencies with jurisdiction (if applicable) including, but not limited to, the following strategies:

Action Item RM-28.1: The County shall develop CEQA standards that require disclosure of impacts to all sensitive biotic communities during review of discretionary projects. These standards shall require the following mitigation:

- *<u>Sensitive Biotic Communities</u> – For all sensitive biotic communities, restore or create habitat at a no net loss standard of habitat value lost. Where it is determined that*

restoration or creation are ecologically infeasible, preserve at a 2:1 ratio for habitat loss.

- *Oak Woodland – Maintain and improve oak woodland habitat to provide for slope stabilization, soil protection, species diversity and wildlife habitat through the following measures:*
    - *Preserve, to the maximum extent possible, oak trees and other vegetation that occur near the heads of drainages or depressions to maintain diversity of vegetation type and wildlife habitat as part of agricultural projects.*
    - *Comply with the Oak Woodlands Preservation Act (PRC Section 21083.4) regarding oak woodland preservation to conserve the integrity and diversity of oak woodlands, and retain, to the maximum extent feasible, existing oak woodland and chaparral communities and other significant vegetation as part of residential, commercial, and industrial approvals.*
    - *Provide appropriate replacement of lost oak woodlands or preservation at a 2:1 ratio for habitat loss.*

Consistent. The project will more than meet the mitigation requirements established under this policy (see Impact 4.3-E). In addition, after 30 years the site would be restored to include additional oak woodlands and a pond.

Policy RM-29 All public and private discretionary projects shall avoid impacts to wetlands if feasible. If avoidance is not feasible, projects shall achieve no net loss of wetlands, consistent with state and federal regulations.

Consistent. The project (including recommended mitigation measures) will require filling wetlands. However, the project is consistent with the second part of the policy in that it will include constructing more wetlands than will be filled (see Impact 4.3-D).

Policy RM-42 Direct new development to community areas and limit development of rural resource lands.

Inconsistent. See discussion above under Policy DE-1, which essentially states the same thing.

Policy RM-47 Minimize the exposure of sensitive uses, such as residences, schools, day care, group homes or medical facilities to industrial uses, transportation facilities, or other sources of air toxics.

Inconsistent. Project emissions of air pollutants and toxics will be below all levels that the EPA, State, and Mendocino County Air Quality Management District consider unsafe for humans except for the emission of nitric oxide (NO) and nitrogen dioxide (NO_2) from haul trucks (see Impact 4.6-C). This impact is expected to last until about 2018; after that it would be less than significant (due to reduced emissions from newer trucks).

Policy RM-65 Environmental protection is a high priority during mineral extraction and associated processing operations, and in site reclamation. Recovery of mineral resources is not allowed when the County finds that adverse environmental impacts outweigh the public benefit.

Unknown. The project will cause five significant and unavoidable environmental impacts, mainly related to impacts to aesthetic resources. The County Board of Supervisors will need to determine whether the public benefit outweighs these impacts.

Policy RM-73 The design of new development should emphasize the avoidance of sensitive resources and environments rather than their removal and replacement.

Consistent. As described above, the project will result in loss of oak woodlands and wetlands. However, this is a vaguely-worded policy that uses the word "should," and provides no clear direction. Policies RM-24, 25, and 28 listed above provide a clearer direction regarding these resources, and the project was found consistent with those policies.

Policy RM-106 Land shall not be converted from the Agricultural Lands or Range Lands classifications to non-agricultural classifications unless all of the following criteria are substantiated:

- *The project will not result in a need for unintended expansion of infrastructure in conflict with other policies.*
- *The project will not adversely affect the long-term integrity of the agricultural areas or agricultural uses in the area.*
- *The proposed use in the subject location will achieve the long-range objectives of the General Plan.*

Unknown. Technically, the policy may not apply since the project does not seek to convert Range Lands to another land use classification. Even if the policy were deemed applicable, the project would not result in extension of public infrastructure nor affect agricultural activities in the area. The Board of Supervisors would need to determine whether the project would achieve the long-range objectives of the General Plan.

Policy RM-122 Prohibit rezoning and development of prime timberland (Site Classes I, II and III) classified for resource uses, including proposed resort uses, unless …:

Consistent: Site soils do not support prime timberland.

Policy RM-128 Protect the scenic values of the county's natural and rural landscapes, scenic resources, and areas of significant natural beauty.

Inconsistent. The project will adversely affect views from Highway 101, Ridgewood Ranch, and Black Bart Drive (see the four impacts in Section 4.7, Aesthetics).

Policy RM-134 The County shall seek to protect the qualities of the nighttime sky and reduce energy use by requiring that outdoor nighttime lighting is directed downward, kept within property boundaries, and reduced both in intensity and direction to the level necessary for safety and convenience.

Consistent: Project lighting will be minimal except during the times nighttime operations of the asphalt plan occur. Lighting will be directed downward and otherwise mitigated consistent with this policy (see Impact 4.7-D).

3. Mendocino County Zoning Ordinance

The site is within the Rangeland (R-L) District. The Rangeland District allows Extractive Uses such as quarries with County approval of a major use permit. The Extractive Use Types section (Section 20.036) allows some processing of aggregates on the site, but it contains the following limitations:

> "All such processing shall be of a temporary nature and carried on in conjunction with, and only for the duration of a specific construction project (except that portable screening and crushing equipment need not be related to a specific construction project)."

Inconsistent. The project is inconsistent with existing County zoning. However, it would be consistent if the proposed Mineral Processing Combining District is approved as an addition to the Zoning Ordinance and the 18-acre site that includes the asphalt processing facility is rezoned to this new district.

An attorney retained by Keep the Code commented on the original EIR that the County could not approve a rezoning that is inconsistent with the County General Plan. However, as described in Policy DE-17, "…uses determined to be related to and compatible with ranching, conservation, processing and development of natural resources, recreation, utility installations," are allowed in the Range Land classification. If the County were to approve the new zoning district, it would need to find that the uses allowed under the proposed district are consistent with this list of compatible uses.

4. Mendocino County Surface Mining and Reclamation Regulations

Chapter 22.16 of the County Zoning Ordinance contains the Surface Mining and Reclamation Regulations. The regulations describe how projects like the proposed Harris Quarry expansion need to obtain a use permit and meet the following operational standards:

(A) Access Roads. All private access approaches leading off any paved public street onto a mining site shall be adequately surfaced to prevent aggregate or other materials being drawn onto the public right-of-way.

(B) Dust Suppression. All haul roads and driveways shall be maintained as necessary to minimize the emission of dust. Maintenance shall be conducted as necessary to prevent

a nuisance to adjacent properties. Special maintenance procedures (watering, or other acceptable dust palliative, etc.) may be placed on the permit.

(C) Driveway Encroachment Permit. If required, a Driveway Encroachment Permit issued by the Mendocino County Department of Transportation shall be a condition of the mining permit.

(D) Any waters discharged from the site to adjacent lands, streams, or bodies of water or to any groundwater body shall meet all applicable water quality standards of the Regional Water Quality Control Board and any other agency with authority over such discharges. Records of any water quality monitoring conducted in conjunction with the requirements of such agency or agencies shall be made available to the Director on request. Discharges of water to designated on-site settling ponds or desilting basins shall not be deemed to be in violation of this part solely on the basis of sediment content.

(E) During the period mining operations are being conducted, and prior to final reclamation of mined lands, measures shall be taken to prevent erosion of adjacent lands from waters discharged from the site of mining operations and the off-site discharge of sediment. Such measures may include the construction of properly designed retarding basins, settling ponds and other water treatment facilities, ditches, diking and revegetation of slopes. Settling ponds and other water treatment facilities shall be located and managed so that accumulated sediment will not enter any stream.

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

(G) Excavations which may penetrate near or into usable water bearing strata shall not substantially reduce the transmissivity or area through which water may flow unless approved equivalent transmissivity or area has been provided elsewhere, nor subject such groundwater basin or subbasin to pollution or contamination.

(H) Permits issued for surface mining operations proposed to be conducted between the banks of a stream may include as conditions any measures or conditions imposed by other agencies of jurisdiction, for example, but not limited to, the Department of Fish and Game, the National Marine Fisheries Service, the North Coast Regional Water Quality Control Board, and the Army Corps of Engineers. Copies of conditions imposed by such agencies shall be on file with the Department of Planning and Building Services before any permit issued by Mendocino County shall be deemed to be in effect.

(I) All operators of mining operations requiring mining permits and/or reclamation plan approvals shall annually supply to the Director no later than June 1st of each year an annual report which identifies the quantities and types of materials displaced, processed, stockpiled and hauled off-site.

(J) Noise levels created by the operation as measured at the nearest residence other than that of the mine owner or operator shall not exceed the following:
(1) Sixty-five (65) dB(A) for a cumulative period more than thirty (30) minutes in any hour;

(2) Seventy (70) dB(A) for a cumulative period more than twelve (12) minutes in any hour;
(3) Seventy-five (75) dB(A) for a cumulative period more than three (3) minutes in any hour;
(4) Eighty (80) dB(A) for a cumulative period more than one (1) minute in any hour;
(5) Eighty-five (85) dB(A) at any moment.
(6) More stringent noise standards may be required as permit conditions when particular local circumstances warrant additional protection of potentially affected residences.

Any noise control measures prescribed by the lead agency as a condition of a permit shall in no manner be interpreted as to preclude the application to the surface mining site of future noise control measures adopted by the County subsequent to the granting of the permit.

(K) Any permit which is not used within two (2) years from the effective date thereof shall be null and void. For the purpose of this Section, the requirement that the permit be used shall be met either by the beginning of a substantial surface mining operation in accordance with the approved mining plan, or by demonstrating that the permittee has incurred substantial expense in an attempt to secure required permits at the State or Federal level, but that, despite due diligence, the permits have not yet been issued, and that it is probable that they will be issued within an additional eighteen (18) months from the expiration of the two (2) year period.

Consistent. With implementation of EIR-recommended mitigations, the project would be consistent with these standards. The regulations also include reclamation standards. Again, the project would be consistent with these standards with the implementation if all EIR-recommended mitigation measures.

5. California Surface Mining and Reclamation Act (SMARA)

The California Surface Mining and Reclamation Act (SMARA) establishes procedures and guidelines to ensure that all surface mines and quarries are successfully reclaimed. Previous sections of this EIR have identified portions of the proposed Reclamation Plan that are inconsistent with SMARA requirements and described the additions or revisions needed to make the Reclamation Plan consistent with the requirements. One general SMARA requirement is that the Reclamation Plan specifically must identify the date of the initiation and termination of the surface mining operation (PRC Code Section 2772(c)(3). The original EIR described how the original project was not consistent with this requirements and all the reasons that the permit should have a defined, and shorter, length. In revising the project, the applicant has reduced the permit length to 30 years, thereby eliminating the concerns expressed in the original EIR.

Chapter 5.0

Topical Issues and Impact Summaries

5.0 TOPICAL ISSUES CHAPTER

5.1 Growth-Inducing Impacts

CEQA mandates that an EIR assess potential growth-inducing impacts of a project. The *CEQA Guidelines* describe the required assessment in the following way:

> *Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment* (CEQA Guidelines, Section 15126.2(d)).

Growth-inducing impacts usually arise when a project would provide new infrastructure or public services that can be used to serve other future projects. The analysis should be balanced with the general rule that EIRs should evaluate foreseeable, but not speculative, impacts. Note that the assessment of growth-inducing impacts is not the same assessment that is required for cumulative impacts (which are assessed in each section of Chapter 4.0 of this EIR). Growth-inducing impacts refer to impacts that might arise from the project if it were approved while cumulative impacts are the impacts resulting from the project plus other projects that have been specifically approved or proposed.

The proposed project would provide various forms of aggregate, including asphalt, that would be used In a variety of building projects, including highways, roads, driveways, parking lots, leachfields, stream repair and restoration, and construction of most types of buildings. Without this aggregate being produced by some operator, it would be difficult for the local population to construct new facilities or repair existing facilities.

Aggregate, and asphalt are produced when there is a demand for it. The general plans of the County and the four incorporated cities in the County allow a certain amount of growth and describe where that growth can occur. Future aggregate mining and mineral processing are not expected to encourage any development or growth that is in conflict with adopted general plans. Even in those cases where growth in certain parts of the County may exceed general plan-projected growth levels, this growth is a result of market forces for new housing and employment opportunities. This growth is not induced by the availability of aggregate and asphalt. Further, if aggregate and asphalt were not available from Harris Quarry, it would be available from other sources in the County or, if there was a shortage of these materials in the County, from sources outside the County. While the cost of aggregate and asphalt from more distant sources might increase if the proposed project were not approved, there is no evidence that this price increase would substantially slow or stop new development in the County.

Indirectly, the proposed project would result in the hiring of four additional on-site employees and five additional off-site employees. This small increase in employment would not have any measurable effect regarding an increased demand for housing or public services and utilities.

If the County adopts the proposed Mineral Processing Combining District, this could induce additional quarry owners to seek a rezoning to this district in order to allow them to develop asphalt facilities near their quarries. As discussed in Impact 4.9-C, it is unlikely (given quarry size and location) that such rezoning would be sought by the three quarry owners whose property is eligible to be rezoned. If such rezonings were sought, they would need to first undergo CEQA review, and the results of that review are speculative at this time. Approval of the project would not be expected to substantially induce the development of additional asphalt facilities in the County. While it is speculative, approval of the district might induce the owner of one other quarry (Blue Ridge Rock Quarry near Highway 101 between Hopland and Cloverdale) to seek development of processing facilities. This is considered a less-than-significant inducement to growth. In summary, the project would have ***less-than-significant*** growth-inducing impacts.

A number of people commenting on the original EIR requested that the EIR include a discussion of whether there is a need for more aggregate and/or an additional asphalt plant. While these questions may be important when the County considers the merits of the project, they are not CEQA-related issues. The EIR assesses the project as the applicant proposes it. It is not the role of the EIR to determine the need for products. Such economic issues are important for an EIR only when a project might cause other businesses to cease operation thereby potentially causing "blight." There is no evidence that the project would cause the termination of other quarries or asphalt plants or result in blighted conditions in the County.

5.2 Project Alternatives

CEQA requires that the EIR assess alternatives to the project if the project will have significant environmental impacts, even if these impacts can be mitigated to a level that is less than significant. As noted in Chapter 4.0 of this EIR, the project will have a number of significant impacts. This EIR therefore assesses alternatives to the project.

The *CEQA Guidelines* offer a number of requirements and recommendations regarding the alternatives analysis. The more pertinent issues are summarized as follows:

- A range of reasonable alternatives must be assessed. The range must be sufficient to permit a reasonable choice of alternatives so far as environmental aspects are concerned. The EIR need not assess multiple variations of alternatives. The range of alternatives to be assessed is governed by the rule of reason.

- Alternatives must be ones that could feasibly attain most of the basic objectives of the proposed project. While alternatives can impede the attainment of the

objectives, they should not substantially impede those objectives. Alternatives that fundamentally change the nature of the project do not meet the basic objectives of the project.

- The alternatives must be feasible. Feasibility takes into account factors such as site suitability, economic viability, availability of infrastructure, consistency with the General Plan, other plans and regulatory limitations, jurisdictional boundaries, and ability to acquire, control, or gain access to alternative sites.

- The analysis of the alternative must determine whether the alternative reduces the significant impacts identified for the project. If the alternative would generate additional significant impacts, those must be identified and discussed.

- One of the alternatives to be assessed must be the "no project" alternative. (See discussion below under that heading.)

- The EIR must assess the identified alternatives and determine which among the alternatives (including the project as proposed) is the environmentally superior alternative. If the no project alternative is identified as the environmentally superior alternative, then another of the alternatives must be identified as the environmentally superior alternative among the remaining alternatives.

Given these mandates, this EIR assesses the following alternatives:

1. No Project – No Future Development
2. No Project – Future Development Consistent with Land Use Classification
3. Quarry Only
4. Quarry and Temporary Asphalt Plant
5. Project Redesign
6. Reduced Production
7. Alternate Location

The alternatives have been selected to reduce as many impacts as possible, with emphasis on reducing the remaining four significant and unavoidable visual impacts. The alternatives selected for analysis provide a wide range of alternatives, which can be used to test effects against the proposed project as well as one another. Undoubtedly other combinations of project components and phasing could be developed to create additional alternatives. However, CEQA does not require that every conceivable mix of uses and mitigations be analyzed, but that a range of alternatives be assessed. Seven alternatives is more alternatives than typically assessed in an EIR and should provide decision-makers and the public with sufficient information to understand how alternatives (or portions of alternatives) may reduce or eliminate impacts identified for the project as proposed. If it wishes, the County can select portions of these alternatives and approve a hybrid alternative.

1. Alternative 1 – No Project – No Future Development

CEQA requires that an EIR address the "no project" alternative. Formerly, the analysis of this alternative assumed no development of the site. Subsequent changes to CEQA

require this analysis to discuss existing conditions as well as what can reasonably be 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 1 assesses the "no development" scenario," while Alternative 2 addresses no development of the proposed project but future development of the site consistent with current zoning and services.

a. Description

The existing quarry would terminate operation and be reclaimed per the existing Reclamation Plan (since the permit has now expired), and no future development would occur on the proposed site.

b. Environmental Impacts

Geology and Soils

Mining would cease, so there would be no further removal of material from the hill where the quarry is located. The site would be reclaimed reducing erosion of soil (though this eroded soil is captured within the mining floor). Potential slope instability impacts would be eliminated with completion of reclamation. There would be no development of the asphalt processing facility, internal haul road, or Highway 101 widening, so all geological impacts associated with unstable slopes, seismic hazard, and soil erosion would be eliminated.

Hydrology and Water Quality

There would be no new impermeable surfaces developed, and, thus, no increase in runoff from the site. In addition, there would be no expansion of the quarry and therefore no decrease in peak flows. Downstream drainage channels and streams would not be affected by any changes in runoff. There would be no soil erosion, so there would be no impact to water quality. There would be no transport, storage, or use of diesel fuel, oil, gasoline, and other hazardous substances, so there would be no risk of spills adversely affecting water quality of Forsythe Creek or downstream of that creek. All hydrologic and water quality impacts would be eliminated.

Biological Resources

The existing vegetation on the site would remain. The site would continue to provide habitat for those wildlife species that currently use the site. There would be no impacts to biological resources. Upon completion of reclamation, there would be more plant and wildlife habitat on the site than there is currently.

Traffic

Following completion of reclamation, there would be no new traffic generated by the alternative. Existing traffic from the quarry would be eliminated. Therefore, there would be a reduction of traffic on Highway 101 affecting the project driveway intersection and the Black Bart Drive intersection. On a regional basis, haul truck traffic would remain on

Highway 101 to haul aggregate and asphalt from other quarries and processing facilities to customers. Because other asphalt plants on the Highway 101 corridor are not adjacent to quarries, there could be more traffic on the highway than for the proposed project. Safety hazards involving large trucks turning in and out of the project site would be eliminated.

Several commenters on the original EIR requested additional analysis to corroborate the original EIR conclusion that the project would reduce overall truck traffic on Highway 101. The traffic study conducted for the applicant contains an analysis of the vehicle miles traveled to haul aggregate and asphalt with and without the project. Vehicle miles traveled (VMT) is the measure of the total miles traveled by residents, customers, employees and delivery of goods from a source location, and is typically calculated on an annual basis. VMT also serves as a measure of the broader potential impacts of vehicle travel on an area wide circulation system and correspondingly relates to fuel consumption and vehicle emissions, including greenhouse gases. The Wtrans report dated January 27, 2010, as amended by their April 27, 2010 Addendum (which added the recently-approved Kunzler Quarry to the analysis scenario) and their February 2011 Errata Memo, all included in Appendix C of this EIR, describe the assumptions and methodology used to calculate the VMT with and without the project. This methodology and approach was peer reviewed by the EIR traffic engineer who concluded that the methodology and assumptions were acceptable for planning level comparisons.

As shown on Table 5.2-1, the increased production of the Harris Quarry project will not reduce the number of truck trips hauling aggregate and asphalt, but it will result in a reduction in the VMT because the Harris Quarry is closer to major population centers and geographical centers of the County, resulting in shorter trip lengths and correspondingly fewer vehicle miles traveled to transport the same amount of aggregate. Aggregate haul truck VMT would be reduced by 30,490. This reduction in VMT increases once the Kunzler Quarry begins production (as shown in the column of "Project plus Near Term Cumulative"). The two quarries combined would reduce VMT by aggregate haul trucks by 931,000 vehicle miles traveled annually.

The asphalt plant will increase the number of trips to and from the site but will reduce the total number of VMT in the County overall as the trip lengths are typically shorter than those made by out-of-County sources. The project would reduce asphalt truck travel by 153,000 miles traveled per year. The project has the potential to decrease the total VMT associated with hauling aggregate and asphalt within Mendocino County by approximately 183,500 VMT annually. When coupled with the Kunzler Quarry, the two projects would potentially reduce VMT by 1.08 million miles annually.

It is anticipated that VMT in the County related to aggregate demand will increase in the future as the population and consequent demand for aggregate increases. As the demand for aggregate and asphalt increases, while production levels within the Mendocino County remain constant (if the project is not approved), the shortfall will be filled by out-of-County sources. Trips made from out-of-County sources have greater travel distances and result in higher VMT overall. Conversely, the expansion of the Harris Quarry together with asphalt production will result in fewer VMT in the future as a greater portion of the total demand will be met by quarries and asphalt plants within Mendocino County and less by out-of-County sources.

While the increased aggregate production and a new asphalt plant associated with the Harris Quarry project will reduce the need to import aggregates and asphalt into the County, the project would not eliminate the need to import aggregate and asphalt to meet current

Table 5.2-1
Vehicle Miles Traveled Summary

Quarry Aggregate VMT	**Base Permit**		**Project**		**Project plus Near Term Cumulative**		**Change In VMT**
	Annual Trips	**Annual VMT**	**Annual Trips**	**Annual VMT**	**Annual Trips**	**Annual VMT**	
Harris	3,719	98,761	7,550	225,263	9,420	355,943	257,182
Davis Pit	3,721	322,636	3,579	318,899	970	96,567	-226,069
Keithly Ranch	4,959	415,506	4,747	401,631	1,303	126,538	-288,968
DNA River	1,240	145,695	1,209	144,970	217	28,896	-116,799
Cooks Humboldt	992	133,202	973	129,297	177	22,617	-110,585
Ford Gravel	9,920	287,671	8,096	236,262	9,649	372,762	85,091
Ten Mile	2,480	75,480	2,018	58,816	2,693	74,219	-1,261
Pieta	2,481	109,033	2,058	89,771	2,070	61,471	-47,562
Layton Rock	2,480	69,650	2,088	47,997	2,463	61,471	-8,179
Cooks Valley	2,480	329,488	2,420	319,171	513	65,387	-264,101
Wisley Ranch	744	25,178	591	19,419	814	25,373	195
Coal Mine	1,241	108,060	1,199	104,864	353	28,241	-79,819
Syar Healdsburg	2,449	326,041	2,412	319,551	447	65,321	-260,720
Kunzler	0	0	0	0	7,845	130,187	130,187
Total	***38,936***	***2,446,401***	***38,940***	***2,415,911***	***38,934***	***1,514,993***	***-931,408***
Plant (AC VMT)							
Harris	0	0	2,644	85,621	2,644	85,621	85,621
Granite	7,499	284,767	5,444	183,063	5,444	183,063	-101,704
Baxman	1,718	71,146	1,815	61,089	1,815	61,089	-10,057
Bodean/Syar (Santa Rosa)	2,501	445,239	1,816	318,347	1,816	318,347	-126,892
Total	***11,718***	***801,152***	***11,719***	***648,120***	***11,719***	***648,120***	***-153,032***
Project Total	**50,654**	**3,247,553**	**50,659**	**3,064,031**	**50,653**	**2,163,113**	**-1,084,440**

Note: VMT = Vehicle miles traveled

and future demand, and importation of aggregate and asphalt will remain a significant component in fulfilling the need for these products in Mendocino County.

This VMT analysis is based on several modeling assumptions. It is possible that the reductions on VMT could be less (or more) than described here. However, the modeling does indicate that the project would result in at least some reduction in VMT. Therefore, it is concluded that for Alternative 1, if the project were not approved, there would be an increase in VMT, especially by trucks hauling asphalt.

Air Quality

Following completion of reclamation, emissions of diesel particulates, dust, and other pollutants from the quarry would cease. Local emissions from haul trucks would end (though regionally, the amount of pollutants emitted from trucks hauling aggregate and processed materials might remain the same or actually increase due to increased trips between quarries and processing facilities). There would be no new emissions from the asphalt plant. The regional emissions of pollutants and greenhouse gases would exceed the emissions from the proposed project, as there would be more VMT under this alternative. The alternative would eliminate all local air quality and odor impacts caused by the project.

Noise

Once reclamation was complete, there would be no additional noise generated by the proposed alternative.

Aesthetics

There would be no removal of trees or other vegetation, and no construction of new facilities. There would be no visual impacts. The existing bare quarry face would be reclaimed. The alternative would eliminate all visual impacts of the project.

Public Services

There would be no new demand for public services or infrastructure. Upon completion of site reclamation, there would not be a risk of fire ignitions. It is unknown whether the new water tank would be maintained to provide stored water for firefighting. There would not be withdrawals of water from site wells or springs, so there would be no impact on local groundwater supplies. There would be no need to construct an on-site wastewater system.

Hazards and Hazardous Materials

After completion of reclamation, there would be no transport, storage, or hauling of hazardous materials on the site. Any potential impacts from spillage or accidental release would be eliminated.

Land Use

This alternative would be consistent with the General Plan and Zoning Ordinance as it would reclaim the site and leave it open for rangeland uses. The alternative would not include adding the new Mineral Processing Combining District to the County Zoning Ordinance. Therefore, there would not be any potential adverse impacts resulting from development of processing facilities on other quarry sites that are classified as Range Land.

Cultural Resources

This alternative would eliminate impacts to cultural resources.

Energy Use

Once reclamation is completed, there would be no expenditure of energy on the project site other than possible occasional motor vehicle use. Regionally, the need to produce asphalt at separate locations from quarries would result in more energy use than the proposed project (i.e., more fuel used to haul aggregate and asphalt).

c. Conclusions

Once the reclamation phase is completed, the No Project Alternative eliminates all the potentially significant impacts of the proposed project except the regional impact of emissions of NOx (nitric oxide and nitrogen dioxide) from haul trucks. There would be an increase in severity for this impact. It is the environmentally superior alternative. However, the alternative does not meet any of the objectives of the project.

The alternative would have secondary effects because it would mean that the aggregate, and asphalt demand for the area would need to be met at other area quarries and processing facilities. Production at these other facilities could have adverse site-specific effects as well as increased regional impacts such as vehicle miles travelled, emission of air pollutants, emission of greenhouse gases, and additional energy use.

The alternative does not meet any of the applicant's five objectives.

2. Alternative 2 – No Project – Future Development Consistent with Land Use Classification

a. Description

This alternative would terminate quarry activities and reclaim the quarry site per the existing Reclamation Plan. No improvements would be made on Highway 101. The site is classified and zoned Rangeland with a minimum parcel size of 160 acres. The project property includes about 322 acres. The project site could support one new residence (though perhaps as many as two residences might be constructed on the entire property). For purposes of this EIR analysis and comparison, it will be assumed that one new residence would be developed in or near the location of the asphalt processing facility (since this is the part of the project site with the best access; better views; and

quieter than near Highway 101). The other residence would be located to the west with access via Black Bart Drive.

b. Environmental Impacts

Geology and Soils

Development of two housesites would require grading to develop building pads and driveways. This grading would cause soil erosion. Grading for dwelling pads does not require a grading permit unless cuts or fills are more than 5 feet above grade, so it is questionable whether best management practices that are required for the quarry project would be required and/or implemented for these individual projects. The alternative would eliminate further mining, thus eliminating topographic changes at the quarry site. It would result in less grading thereby reducing possible seismic and slope stability impacts. It would reduce the potential for soil erosion.

Hydrology and Water Quality

Runoff from the new homesites would not be expected to substantially increase runoff in Forsythe Creek or the Russian River. Rural homesteads frequently consist of one acre of developed area, or one acre of impermeable surface. So, the alternative would generate less new runoff to Forsythe Creek than the proposed project, but in neither case would the impact be significant. As noted above, there could be stream sedimentation from eroded soils plus runoff of other typical domestic residues (landscaping chemicals, oil/grease residues, etc.). It is likely that the amount of pollution entering Forsythe Creek would be less than for the proposed project.

Biological Resources

Development of two homesites plus driveway accesses would result in loss of vegetation. It seems likely that development of a home on the asphalt processing facility site could be done without removing large oaks. It is possible that oak trees and other trees would be removed for development of the other residence, and there would be no mitigation requirement for this removal, since construction of a single-family residence is typically exempt from CEQA review. As much as 2+ acres could be cleared for residence and driveway development. Additional trees could be removed to meet defensible space requirement. Since biological surveys would not be required, it is possible that construction of the other residence could destroy or adversely affect special status plants and wildlife and disturb nesting birds.

Wildlife habitat could be displaced, with possible disruption of travel or migration routes. Domestic dogs and cats would adversely affect bird and wildlife populations near the homesites. Runoff from the homesites could adversely affect water quality, thereby adversely affecting salmonids.

Dividing the property into two properties and developing homesteads on those individual properties would fragment the habitat available to wildlife; this is a common effect of the large-lot rural residential development occurring in the north coast and foothill areas of California.

There would be no loss of additional vegetation on the quarry site. The site would be reclaimed with natural vegetation planted as required by the existing Reclamation Plan, resulting in a reclaimed site decades earlier than would occur for the proposed project. The stream channel along the west side of the access road would not be filled. Highway 101 would not be widened, so there would be no loss of trees along the west side of the highway. There would be no grading to prepare the processing facilities pad, so all or most trees in this area would be preserved. The alternative would preserve more natural habitat on the quarry/asphalt processing site than the proposed project, though as noted above, the alternative could remove natural habitat at other locations on the property.

Overall, the alternative would have less impact on biological resources. The alternative would also result in less of the hillside being excavated and a more rapid reclamation of the quarry.

Traffic

The project would generate 20 new trips per day on Black Bart Drive. This small increase would not be expected to significantly affect the operations of that road or its intersection with Highway 101. It is not expected that the project would cause significant traffic safety impacts. The alternative would eliminate ingress and egress of large trucks from the project driveway to Highway 101. This would eliminate all traffic safety impacts associated with this intersection and truck-related impacts at the Black Bart Drive intersection. No improvements would be made to Highway 101. As was discussed under Alternative 1, because other asphalt plants on the Highway 101 corridor are not adjacent to quarries, there could be more vehicle miles traveled per year than for the proposed project.

Air Quality

The new traffic would emit small amounts of air pollutants, which would not be expected to substantially affect air quality in the area or regionally. Construction and use of these homesteads would generate greenhouse gases. The distance of the residences from jobs, schools, and shopping mean that there will be substantial vehicle use, which would generate greenhouse gases.

The alternative would eliminate the dust and other emissions caused by quarry activities, the pollutant emissions and odor from the processing facilities, and vehicle emissions from diesel trucks in the area. The alternative would have a significant air quality benefit when compared to the project as proposed.

Similar to Alternative 1, the regional emissions of pollutants and greenhouse gases from this alternative would exceed the emissions from the proposed project, as there would be more VMT under this alternative.

Noise

Depending on the location of the homesites, constructing the improvements could affect neighbors. This would not be the case for the homesite where the processing facilities are proposed, since there are no nearby neighbors. This would be a temporary impact

in any case, and not considered significant. Residential use would generate noise, but that noise would be typical for the area and not considered significant.

The alternative would eliminate project-generated noise impacts on residents of Ridgewood Ranch and Ridgewood Subdivision. The effects of blasting at the quarry would also be eliminated. The alternative would substantially reduce the noise impacts of the proposed project.

Aesthetics

The home on the asphalt processing facility site would be visible from Black Bart Drive near the site and possibly from residences on the Ridgewood Subdivision to the west. Without knowing the location of the other home, it is speculative about what visual effects it would have. Though at least one of the homes would be visible to travelers on Black Bart Drive, the addition of one to two homes would not significantly affect views, though they could detract from the rural character of that section of the road.

The alternative would eliminate the expansion of the quarry that would remove much of the hillside above the quarry, It would result in short-term reclamation of the existing quarry. It would eliminate the significant and unavoidable visual impacts on views from Highway 101 and eliminate impacts to views from Ridgewood Ranch. Replacing the processing facilities with one home would reduce the significant and unavoidable impact to views from Black Bart Drive and the night lighting impact to a less-than-significant level.

Public Services

The alternative would increase demand for public services. Two new rural households would increase demand for fire and police response. The homes would generate about two new students. There would be solid waste generated. However, none of these impacts would be expected to be significant.

Wells or springs would need to be developed to provide water. Depending on the location of the wells, they could affect the groundwater table. The alternative would use less groundwater than the proposed project.

Septic systems would be developed. So long as they are constructed and operated per County health requirements, these private septic systems should not adversely affect the environment. The impact would be approximately the same as the proposed project.

The homes would need to be built consistent with CAL FIRE requirements for new home construction in State Responsibility Areas. This would include access, defensible space, and fireflow storage requirement. While these requirements would reduce the risk of wildfire burning these new homes, it does not eliminate the increased risk of ignition. Two new homesites would increase the locations where fires could ignite and spread to neighboring properties.

It is speculative the two new homes would be as much of a fire hazard and require as much fire response as the proposed project. It is also unknown whether the existing

large tank constructed by the applicant would be maintained as a water source that could be used for fighting fire in the larger area (since the property owner may find it fiscally infeasible to keep such a large tank filled with water).

Impacts on public services would be different than for the proposed project; these impacts could all be mitigated to a less-than-significant level.

Hazards and Hazardous Materials

There would be no transport of oils, fuels, blasting materials, or the other materials required for the quarry and processing facilities. At most, there would be transport of small amounts of fuels and typical household chemicals. There would be less risk of accident and spills of hazardous materials into the environment.

Land Use

This alternative would be consistent with the General Plan and Zoning Ordinance. The project would be consistent with existing land use development in the region. The alternative would eliminate the possibility of processing facilities being developed on other quarry properties classified as Range Land, thus eliminating all the potential site-specific impacts that could result from development and operating of those other facilities. The alternative would eliminate land use conflicts of the processing facilities with rural residential and rangeland uses.

Energy

The residences would require energy to construct, and people inhabiting the homes would use energy similar to other rural residential inhabitants. There is no evidence that providing these residents energy would require developing new energy sources or require major infrastructure improvements.

Other Resources

Cultural resources would not be affected by development of a homesite at the processing facilities site. It is unknown whether cultural resources would be affected by development of the other two homes. By not expanding the quarry, the alternative does not make beneficial use of known mineral resources.

c. Conclusions

Alternative 2 (No Project – Future Development Consistent with Land Use Classification) eliminates all the potentially significant impacts of the proposed project except the regional impact of emissions of NOx (nitric oxide and nitrogen dioxide) from haul trucks. There would be an increase in severity for this impact. It substantially reduces most other potential project impacts. It results in short-term reclamation of the quarry, and it is environmentally superior to the project as proposed.

The alternative would have secondary effects because it would mean that the aggregate and asphalt demand for the area would need to be met at other area quarries and

processing facilities. Production at these other facilities could have adverse site-specific effects as well as increased regional impacts such as vehicle miles travelled, emission of air pollutants, emission of greenhouse gases, and additional energy use.

The alternative does not meet any of the applicant's five objectives.

3. Alternative 3 – Quarry Only

a. Description

This alternative includes extension of a 30-year permit for the quarry allowing the production rate requested by the applicant. The alternative would not include construction of the asphalt processing facility or the road to the asphalt processing facility or the new road to the water tank. The recommended Highway 101 improvements would not be part of this alternative, as it is assumed that it would be fiscally infeasible to construct these highway improvements without the revenue generated by the asphalt plant. The alternative would not include the proposed Mineral Processing Combining District. The intent of including this alternative is to allow comparison of the project with an alternative that eliminates the impacts associated with on-site processing of materials and manufacture of asphalt. And an alternative that does not include the extensive Highway 101 improvements.

b. Environmental Impacts

Geology and Soils

The alternative would have the same geologic and soil impacts relative to the quarry operations as the proposed project. There would be slope stability concerns and soil erosion. However, these impacts could be mitigated. The alternative would eliminate grading for highway and road improvements and the pad for the processing of materials. This would eliminate unstable slope issues and soil constraints for this part of the project. The alternative would generate less soil erosion than the project.

Hydrology and Water Quality

Runoff from the quarry itself is captured on the quarry floor and does not outlet off the site, so the alternative would have no impact on off-site flooding or water quality. Similar to the project, there would be a small reduction in peak flows to Forsythe Creek. Elimination of the other components of the project means elimination of potential water quality impacts from eroded soil, residues washed from impervious surfaces, and possibly spilled materials. The hydrologic impacts of this alternative would be less than significant, and they would be less than for the proposed project.

Biological Resources

The alternative would remove the same amount of vegetation within the expansion area as the proposed project. The alternative would eliminate impacts to vegetation at the asphalt processing facility, preserving true oaks in this area. Because Highway 101 would not need to be widened, the stream along the access road would not need to be

filled. There would be no filling of wetlands or stream channels. There would be no loss of trees or wetlands due to expanding Highway 101. There would be less potential impact to nesting birds, and no impact to nocturnal wildlife. More of the site would be left as natural habitat available for wildlife use. Impacts to sensitive biological resources would all be substantially reduced under this alternative.

Traffic

The project would reduce the number of projected trips by trucks hauling asphalt at the project access driveway, but the increased number of trucks carrying aggregate would likely result in approximately the same number of trucks entering and leaving the project site. As no improvements would be made to Highway 101, this would substantially increase traffic safety hazards at the intersection of the highway with the project access driveway and with Black Bart Drive. The alternative would result in a new significant and unavoidable traffic safety impact. As shown in Table 5.2-1, without the asphalt plant on the project site, vehicle miles traveled (VMT) on Highway 101 to transport asphalt would increase by about 153,000 miles per year.

Air Quality

Like the proposed project, the alternative would result in the emission of air pollutants and greenhouse gases from the generator and heavy equipment involved in mining and from diesel haul trucks. Similar to the project as proposed, these emissions could be mitigated to a less-than-significant level except for the NOx emissions from haul trucks. The alternative would not include the emission of pollutants from the asphalt plant. The elimination of asphalt plant emissions locally will decrease air quality and possible health impacts to local residents to the west and south.

It is expected that regional emission of pollutants and greenhouse gases would be worse because of the increase in VMT and since the proposed project includes a contemporary asphalt facility with more air quality controls than older facilities in the region. The increased truck traffic generated by this alternative would increase the emissions of diesel particulates and other pollutants. The alternative would have reduced air pollution effect on local residents, but increased air pollution and greenhouse gas emissions at a regional level.

Noise

The noise impacts from mining activities would be the same as for the project. This noise is audible at certain residences and locales on Ridgewood Ranch, but the impact would not exceed County noise standards. Eliminating the asphalt plant eliminates the noise impacts, including nighttime noise, generated by this facility as well as noise generated by trucks hauling the materials within the site. The alternative would have fewer noise impacts on local residents than the proposed project.

Aesthetics

The expanded quarry would continue to be visible from many vantage points on Ridgewood Ranch, and this would be a significant and unavoidable impact of this alternative. The expanded quarry would be visible from Highway 101. As was the case for the proposed project, this expanded quarry is considered a significant and unavoidable impact of this alternative.

The alternative would eliminate the significant and unavoidable visual impact to views from Black Bart Drive, eliminate the significant night lighting impact, and eliminate visual impacts on residents living west of the site. The alternative eliminates the need for highway widening, thus preserving roadside views in the area where the widening would be required for the project. The alternative would significantly reduce project visual impacts.

Public Services

By removing the asphalt plant and the storage and use of petrochemicals needed for processing, the alternative would reduce the risk of a major fire occurring on the site and the need for fire response. It would also reduce impacts as regards police response, emergency medical response, solid waste disposal, and schools. The alternative would not require as much water. It would slightly reduce potential water demand (however, water is not used in asphalt processing, so the reduction would be small). The alternative would eliminate the need to construct the on-site sewage system, thereby eliminating any construction impacts associated with leachfield development. The quarry operations in this alternative would continue to require public services and water as is the case for the proposed project, and in both cases, these impacts would be less than significant.

Hazards and Hazardous Materials

Diesel fuel and other materials needed to operate the generator and mobile equipment at the quarry would still be stored and used at the quarry site, but the risk of escape to the environment at this location is small. The alternative eliminates the need for transport, storage, and use of large quantities of petrochemicals and other materials needed for asphalt production. This eliminates the risk of accidental spillage or release of these hazardous materials from the processing facilities site. The alternative reduces the transport, storage, and use of hazardous materials, thereby reducing the risk of escape of these materials into the environment.

Land Use

This alternative would be consistent with the General Plan and Zoning Ordinance. The project would maintain existing land uses in the area. The alternative would eliminate the possibility of processing facilities being developed on other quarry properties classified as Range Land, thus eliminating all the potential site-specific impacts that could result from development and operation of those other facilities. The alternative would eliminate any land use conflicts of processing facilities with rural residential and rangeland uses.

Energy

The alternative would reduce existing energy use as it is expected and assumed that the applicant would extend PG&E electricity lines to the quarry site. The alternative would reduce overall local energy usage since it would not be needed to make asphalt. However, asphalt would be made somewhere, so the manufacturing impact would be approximately the same as for the proposed project. Because the alternative would result in an increase in VMT, there would be a corresponding increase in the consumption of diesel fuel.

Other Resources

Cultural resources would not be affected by development of the processing facilities. The alternative would make beneficial use of known mineral reserves.

c. Conclusions

Alternative 3 (Quarry Only) eliminates the significant and unavoidable visual impacts on views from Black Bart Drive and the night lighting impact. It substantially reduces most other potential project impacts. Because it would not include improvements to Highway 101, it would result in a new significant and unavoidable traffic safety impact. Despite this increased traffic safety impact, the overall reduction in impacts makes this alternative environmentally superior to the proposed project. This traffic safety impact could be eliminated if the County decided to approve a hybrid Alternative 3 that includes the same highway improvements that are required for the proposed project.

The alternative would have secondary effects because it would mean that asphalt demand for the area would need to be met at other area quarries and/or processing facilities. Production at these other facilities could have adverse site-specific effects as well as regional impacts including additional vehicle miles traveled, which results in increased emission of air pollutants and greenhouse gases and increased consumption of diesel fuel. The significant project impact associated with NOx emissions would be greater for this alternative.

The alternative meets two project objectives (operating the quarry for 30 years and at the expanded production rate of up to 200,000 cubic yards per year).

4. Alternative 4 – Quarry and Temporary Asphalt Plant

a. Description

This alternative includes all elements of the proposed project except the asphalt processing facility would be issued a temporary use permit that extends for the period that the Willits Bypass is being constructed. The County Zoning Ordinance (Section 20.036.010) currently allows mineral processing "of a temporary nature and carried on in conjunction with, and only for the duration of a specific construction project…" The installation of such a temporary facility would require County approval of a use permit. Based on discussions with Phil Dow of the Mendocino Council of Governments, the

bypass, if funding is restored, is projected to take about 4 years to construct.[121] This alternative would include a zoning variance to allow the asphalt silo to be 75 feet high. The alternative would modify the proposed Mineral Processing Combining District to allow only temporary asphalt production for one discrete project not exceeding one 5-year period during the 30-year permit process. Alternatively, the new zoning district could be eliminated (since County zoning does allow this limited processing use), and the time limits described in the previous sentence could be included in the Use Permit. The asphalt facility site would be reclaimed after 5 years consistent with the Reclamation Plan for the proposed project. The intent of including this alternative is to allow comparison of the project with an alternative that meets most of the project objectives but eliminates the long-term impacts from the asphalt facility.

b. Environmental Impacts

Geology and Soils

The alternative would require the same quarry expansion as the proposed project, and, therefore, have the same geologic and soil impacts as the proposed project.

Hydrology and Water Quality

The alternative would have the same construction-related impacts as the proposed project (unless the asphalt plant pad can be reduced in size). The increase in runoff would be the same as for the proposed project. Potential water quality impacts would be reduced because the petrochemicals and other materials used for asphalt processing would only be transported to, stored, and used on the site for 5 years (at the most) rather than throughout the life of the project.

Biological Resources

The alternative would result in the same loss of habitat as the proposed project. The only difference between the proposed project and this alternative would be the potential reduction in water quality impacts (with corresponding impacts on salmonids and other aquatic species) due to the reduction in the amount of time that petrochemicals and other asphalt processing materials would be on the site.

Traffic

The project would generate the same amount of traffic as the proposed project for at most five years during the 30-year permit. Asphalt haul traffic would be eliminated for the other 25 years. The highway improvements would be required for this alternative. However, as was described for the previous alternatives (see Table 5.2-1), the reduction in project-generated asphalt haul traffic would be replaced by an increase in the miles traveled annually by haul trucks serving other asphalt facilities.

[121] Phil Dow, MCOG Director, personal communication, 7/10/07.

Air Quality

The alternative would result in elimination of asphalt-related emissions for 83 percent of the permit period. Residents in the area would be affected by asphalt emissions and odors for at most 5 years. Potential increases in truck traffic hauling asphalt from other area plants would increase truck-generated emissions of pollutants and greenhouse gases. Otherwise, the alternative would have about the same impacts as the proposed project.

Noise

The alternative would have the same noise effects as the proposed project except that residents to the west of the site would only be able to hear the asphalt facility for at the most five years.

Aesthetics

The alternative would have the same visual impacts as the proposed project except that views from Black Bart Drive would be somewhat reduced when the silos and other components of the asphalt facility are removed from the site. The lighting impact would also be reduced. These reductions in the scope of the project and the amount of lighting would reduce the two visual impacts to Black Bart Drive to a less-than-significant level.

Public Services

By removing the asphalt facility and the storage and use of petrochemicals needed for asphalt processing after 5 years at the most, the alternative would reduce the risk of a major fire occurring on the site and the need for fire response. It would also reduce impacts as regards police response, emergency medical response, solid waste disposal, and schools. Otherwise, the alternative would have the same demand for and impacts on public services as the proposed project.

Hazards and Hazardous Materials

The alternative reduces the risk of spillage of hazardous materials because the petrochemicals and other materials used in asphalt processing would only be on the site for five years at the most.

Land Use

This alternative would be consistent with the existing General Plan and the Zoning Ordinance. The alternative maintains the current possibility of asphalt processing facilities being developed on other quarry properties classified as Range Land, but only for a discrete project and for five years at the most. It is expected that the installation of an asphalt plant for a maximum five-year period would occur only if a major roadway project (like the Willits Bypass) were being proposed. The development of temporary asphalt facilities at other quarries would have the same potential effects as described for the proposed project, though, once again, the asphalt-related impacts would be reduced due to the restrictions requiring a discrete project and a maximum 5-year permitted use.

It is also speculative that asphalt plants would be developed at other quarries (see Section 4.10).

Energy

The alternative would reduce overall local energy usage since it would not be needed to make asphalt for 25 years. However, these materials would be made somewhere, so the overall impact would be approximately the same as for the proposed project. Also, there would be additional consumption of diesel fuel due to the increase in VMT.

Other Resources

Cultural resources would be affected the same as for the proposed project. The alternative would make beneficial use of known mineral reserves.

c. Conclusions

Alternative 4 (Quarry and Temporary Asphalt Plant) would reduce the impacts associated with the making of asphalt since the asphalt plant would only be allowed to operate for a maximum of five years of the 30-year permit. The main advantage of this alternative is that a major industrial use would not be a permanent facility in the rural environment. It would reduce the two significant visual impacts to Black Bart Drive to a less-than-significant level. It would substantively reduce noise and air quality impacts.

It is possible that a smaller pad would be needed for a temporary asphalt plant. If that were the case, there would be a reduction in a range of impacts, including soil erosion, slope stability, increased runoff, potential for water pollution, loss of native vegetation, and visual impacts.

The alternative would be environmentally superior to the project as proposed. The alternative meets two of the applicant's five objectives (maintain the quarry and expand the maximum rate of production), and partially meets three other objectives (develop an asphalt facility, locate processing facilities adjacent to the quarry, and locate the project in a central location between Willits and Ukiah).

It is possible that this alternative is economically infeasible due to the cost of developing the asphalt plant site and only using it for 5 years, and then reclaiming the site. However, absent any economic data from the applicant, this EIR considers this a feasible alternative.

5. Alternative 5 – Project Redesign

a. Description

This alternative includes the project as proposed including all EIR-recommended mitigation measures. In addition, it includes the following two elements:

- Nighttime activities will not be allowed more than 20 nights a year to serve a major road construction project; the County would need to authorize this

nighttime use. The applicant has requested the ability to operate at night up to 100 nights a year. The rationale for such a request appears to be that Caltrans might request nighttime operations when constructing the Willits Bypass in order to minimize traffic congestion impacts. However, it is speculative that nighttime operations would be needed for a new bypass around the City. In fact, nighttime operations might be very unpopular with people living near the bypass route. In any case, this alternative limits nighttime operations to 20 nights a year.

- The applicant will finance their fair share of construction of at least a partial interchange at the project access driveway intersection. At a minimum, this partial interchange would include northbound on and offramps with a highway overcrossing; these improvements would eliminate turns in or out of the quarry across oncoming traffic. Southbound turns into or out of the quarry could either be via the deceleration and acceleration lanes as recommended for the project in this EIR, or the interchange could be fully developed to also include southbound on and offramps. It is expected that Caltrans would require connection of Black Bart Drive to this interchange.

The intent of including this alternative is to allow comparison of the project with an alternative that meets most project objectives and further mitigates project traffic, air quality, and visual impacts.

b. Environmental Impacts

Geology and Soils

The alternative would have about the same potential geologic and soil impacts as the proposed project. It is likely that some additional grading would be required to develop the highway interchange. With implementation of recommended mitigation measures, all geologic and soil impacts can be reduced to a less-than-significant level.

Hydrology and Water Quality

The alternative would have approximately the same potential hydrologic and water quality impacts as the proposed project. With implementation of recommended mitigation measures, all these impacts can be reduced to a less-than-significant level.

Biological Resources

The alternative would have about the same biological impacts as the proposed project, though the interchange could affect more vegetation and wetlands adjacent to the highway. There would be a reduction in potential impacts to nocturnal wildlife, but this is not considered a significant impact for the proposed project. With implementation of recommended mitigation measures, all biological impacts can be reduced to a less-than-significant level.

Traffic

The alternative would generate the same amount of traffic. The interchange would basically eliminate existing as well as project-generated traffic hazard impacts. This would be a major benefit of this alternative. Otherwise, the alternative would have the same potential traffic impacts as the proposed project. With implementation of recommended mitigation measures, all these impacts can be reduced to a less-than-significant level.

Air Quality

The alternative would have the same potential air quality impacts as the proposed project. With implementation of recommended mitigation measures, all air quality impacts can be reduced to a less-than-significant level except for the impact of NOx emissions from haul trucks.

Noise

By eliminating most of the nighttime production, the alternative would reduce the noise impacts on residents in the Ridgewood Subdivision and in the area on Highway 101 just north of the site. Though the projected nighttime noise impacts on these residents would not be sufficiently substantial to be deemed significant, they would at times be audible to some residents. This reduction in nighttime operations would all but eliminate this impact. Otherwise, all noise impacts would be the same and are less-than-significant level.

Aesthetics

The alternative would have the same potential visual impacts as the proposed project except for the nighttime lighting impacts. The alternative would reduce the nighttime lighting impacts as operational lights at the processing facilities would only be on for 20 nights a year at the most. The security lighting would be shielded and otherwise mitigated. This alternative would reduce the significant and unavoidable lighting impact to a less-than-significant level. The other three significant and unavoidable visual impacts would remain for this alternative.

Public Services

The alternative would have the same potential public service impacts as the proposed project. With implementation of recommended mitigation measures, all public service impacts can be reduced to a less-than-significant level.

Hazards and Hazardous Materials

The alternative would have the same potential hazards impacts as the proposed project. With implementation of recommended mitigation measures, all hazards and hazardous materials impacts can be reduced to a less-than-significant level.

Land Use

This alternative would be consistent with the existing General Plan but inconsistent with the Zoning Ordinance. The Range Land General Plan classification does allow processing of natural resources, but the Zoning Ordinance states that such processing is limited to the duration of a specific construction project. The alternative would cause land use conflicts with rangeland and rural residential uses to the west and north. The alternative would result in the possibility of processing facilities being developed on other quarry properties classified as Range Land, with the potential for the potential site-specific impacts that could result from development and operation of those other facilities, though it is speculative that processing facilities would be developed at other quarries (see Section 4.10).

Energy

The alternative would have the same potential energy demand and energy impacts as the proposed project (though there would be a very minor reduction due to the reduced need for lights for nighttime operations). With implementation of recommended mitigation measures, all energy impacts can be reduced to a less-than-significant level.

Other Resources

The alternative would have the same impacts on cultural resources and recreation as the proposed project. These impacts can be reduced to a less-than-significant level. It would have the same beneficial use of mineral resources.

c. Conclusions

Alternative 5 (Project Redesign) reduces the significant and unavoidable visual impacts of night lighting of the processing facilities to a less-than-significant level. It eliminates existing and future traffic safety impacts. It reduces nighttime noise impacts. It is environmentally superior to the project as proposed. The alternative meets all of the applicant's five objectives.

6. Alternative 6 - Reduced Production

a. Description

This alternative allows expansion of the mining area but limits the maximum production rate to the existing limit of 75,000 cubic yards per year for 30 years. The alternative does not include the asphalt plant, Highway 101 widening, or the new combining district zoning. The intent of including this alternative is to allow comparison of the project with an alternative that maintains existing use of the site and partially meets the applicant's project objectives.

b. Environmental Impacts

Geology and Soils

The alternative would have similar geologic and soil impacts relative to the quarry operations as the proposed project. However, because less of the site would be mined, there would be some reduction in impact. There would be slope stability concerns and soil erosion. However, these impacts could be mitigated. The alternative would eliminate grading for highway and road improvements and the pad for the asphalt plant. This would eliminate unstable slope issues and soil constraints for that part of the project. The alternative would generate less soil erosion than the project.

Hydrology and Water Quality

As regards the quarry component, the alternative would have approximately the same runoff and water quality impacts as the project. Elimination of the other components of the project means elimination of potential water quality impacts from eroded soil, residues washed from impervious surfaces, and spilled materials. Less water would be required for this alternative since there would be a reduced need for dust control. It is also possible that less aggregate would be washed under this alternative. The hydrologic impacts of this alternative would be less than for the project, and they would all be less than significant.

Biological Resources

The alternative would remove vegetation within the expansion area, but less would be removed than under the proposed project. The alternative would eliminate impacts to vegetation at the asphalt processing facility, preserving true oaks in this area. There would be no loss of trees due to expanding Highway 101. The stream channel adjacent to the access road and wetlands adjacent to Highway 101 would not be filled under this alternative, There would be less potential impact to nesting birds, and no impact to nocturnal wildlife. More of the site would be left as natural habitat available for wildlife use. The alternative would reduce all biological impacts, and they would all be less than significant.

Traffic

The alternative would generate the same amount of traffic as currently occurs. This would be a reduction in trips as compared to the proposed project. The traffic safety improvements to Highway 101 would not be made. Existing safety hazards involving truck turn movements at the driveway intersection would continue. However, because this is a continuation of baseline conditions, there would be no new impact, and no mitigation would be required. Compared to the proposed project, this alternative would increase the VMT on Highway 101.

Air Quality

The alternative would result in about the same emission of air pollutants from the generator, heavy equipment, and diesel haul trucks as currently occurs. These emission

impacts could be mitigated to a less-than-significant level. The alternative would not include the emissions of pollutants from the asphalt plant as well as from trucks hauling asphalt, though the reduction in these emissions would be local as it is expected that similar emissions would occur at other facilities in the region, plus the increase in VMT would result in increased emissions from haul trucks. It is possible that regional emissions could be worse since the proposed project includes a contemporary asphalt facility with more air quality controls than older facilities in the region. However, the elimination of these emissions on the Harris Quarry site will decrease air quality and possible health impacts to local residents living to the west and south.

Noise

The noise impacts from mining activities would be the same as currently occur. This noise is audible at certain residences and locales on Ridgewood Ranch, but the impact would not exceed County noise standards. Eliminating the asphalt plant eliminates the noise impacts, including nighttime noise, generated by this facility as well as noise generated by trucks hauling the materials within the site.

Aesthetics

The expanded quarry would be visible from many vantage points on Ridgewood Ranch, and this would be a significant and unavoidable impact of this alternative, though the impact would be slightly reduced as less of the hillside would be mined. The expanded quarry would be visible from Highway 101, and this would be a significant and unavoidable impact of this alternative.

The alternative would eliminate the significant and unavoidable visual impact to views from Black Bart Drive and the significant and unavoidable night lighting impact, and it would eliminate visual impacts to residents living west of the site. The alternative eliminates the need for highway widening, thus preserving roadside views in the area where the widening would be required for the project.

Public Services

The demand for public services would be the same as occurs at the existing quarry. By removing the asphalt plant and the storage and use of petrochemicals needed for processing, the alternative would reduce the risk of a major fire occurring on the site and the need for fire response. It would also reduce impacts as regards police response, emergency medical response, solid waste disposal, and schools. The alternative would not require as much water. The alternative would eliminate the need to construct the on-site sewage system, thereby eliminating any construction impacts associated with leachfield development. The quarry operations in this alternative would continue to require public services and water as is the case for the proposed project, and in both cases, these impacts would be less than significant.

Hazards and Hazardous Materials

Diesel fuel and other materials needed to operate the generator and mobile equipment at the quarry would still be stored and used at the quarry site, but the risk of escape to

the environment at this location is small. The alternative eliminates the need for transport, storage, and use of large quantities of petrochemicals and other materials needed for asphalt production. This eliminates the risk of accidental spillage or release of these hazardous materials from the processing facilities site.

Land Use

This alternative would be consistent with the General Plan and Zoning Ordinance. The project would maintain existing land uses in the area. Because there would be no asphalt plant, the alternative would eliminate any land use conflicts between this facility and nearby rangeland and rural residential uses. The alternative would eliminate the possibility of asphalt plants being developed on other quarry properties classified as Range Land, thus eliminating all the potential site-specific impacts that could result from development and operation of those other facilities, though it is speculative that asphalt plants would be developed at other quarries (see Section 4.10).

Energy

The alternative would reduce existing energy use as it is expected and assumed that the applicant would extend PG&E electricity lines to the quarry site. The alternative would reduce overall local energy usage since it would not be needed to make asphalt. However, this material would be made somewhere, so the overall impact would be approximately the same as for the proposed project.

Other Resources

Cultural resources would not be affected by development of the processing facilities. The alternative would make beneficial use of known mineral reserves.

c. Conclusions

Alternative 6 (Reduced Production) eliminates the significant and unavoidable visual impacts on views from Black Bart Drive and the night lighting impact. It substantially reduces most other potential project impacts. It eliminates any future impacts associated with development of processing facilities at other quarries in the County in the Range Land classification.

The alternative would have secondary effects because it would mean that asphalt demand for the area would need to be met at other area quarries and/or processing facilities. Production at these other facilities could have adverse site-specific effects as well as regional impacts including additional vehicle miles traveled, which results in increased emission of air pollutants and greenhouse gases and increased consumption of diesel fuel.

The alternative meets one (maintaining the quarry operations) of the applicant's five objectives.

7. Alternative 7 – Alternate Location

a. Background

In determining whether alternative locations for the project need to be considered in an EIR, CEQA Guidelines Section 15126.6(2)(A) provides:

> The key question and first step to analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.

CEQA Guidelines Section 15126.6(1) provides:

> Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site.

Regarding the criterion of site suitability (i.e., consistency with the project site and project), the Mendocino County Department of Planning and Building Services has determined that the site must be large enough to accommodate the expanded quarry and the asphalt facility, and be located with reasonable access to Highway 101 between the Sonoma County line and the general Willits area.

The quarry that would meet these criteria is the Blue Ridge Rock Quarry located west of Highway 101 near the Sonoma County Line (see Impact 4.10-D where this quarry is described). This quarry has adequate reserves; is currently permitted to process 75,000 cubic yards of material per year; the aggregate is of a quality that would make asphalt and concrete; it has access to Highway 101; and is located in a generally undeveloped area. The project could be constructed at this location. However, the quarry is not for sale, plus the owner has expressed no interest in installing an asphalt facility.

Environmental Impacts

Site surveys were not conducted of this private business, so the precise nature of potential impacts of expanding a quarry operation and adding processing facilities at this quarry remain unknown. The quarry is not far north of an intermittent stream, and it is expected that a project at this site would have similar potential for erosion and impacts to water quality of the Russian River. The quarry site is fairly isolated, located east of Geysers Road just north of the Mendocino-Sonoma Counties boundary. It is expected that a project at this site would eliminate significant visual impacts. It would be expected to have less-than-significant noise impact. Given the relative lack of residential development in the area, there would be less potential for land use conflicts than at the proposed site. Air quality impacts would be decreased due to the reduced number of residents in the area. Impacts to public services and fire hazard would be similar to the

proposed project. The site has more difficult access than the Harris Quarry site, as trucks must negotiate a steep climb (about 800 feet elevation change) to get to the quarry. However, there is straightforward access to Highway 101.

An expanded quarry and the addition of an asphalt plant at this site would reduce the significant and unavoidable impacts identified for the proposed project to a less-than-significant level. The alternate site would not be expected to result in new significant and unavoidable impacts. However, this alternative meets none of the project objectives, and the site is not available for purchase by the project applicant. Therefore, this alternative site is deemed infeasible. If the County denies the proposed project (the No Project Alternative), then it is possible that at some point in the future the current or a future owner of Blue Ridge Rock Quarry might seek a similar project, but that is speculative.

b. Segmenting the Project

Several respondents to the NOP suggested alternate locations to construct the asphalt plant. This alternatives analysis includes an assessment of alternatives that eliminate all project components (Alternatives 1 and 2) as well as eliminating the asphalt plant (Alternatives 3 and 6). If the County were to approve any of those alternatives, it would have the same effect as placing the asphalt plant at another location. That is, if the applicant does not receive approval to install the asphalt facility as part of this project, then the applicant would have the ability to seek an alternate site(s) and seek approval for development of that site. Even though an alternate site for the asphalt plant is not a project alternative for this project, the following discussion provides the public and decisionmakers with information concerning where those possible sites might be located and what the impacts of developing those sites would be. This survey focuses on sites classified and zoned as Industrial.

The Multiple Listing Services (MLS) for industrial sites in the Willits, Calpella, and Ukiah areas, with sites being between 3 and 15 acres in size. Three sites of sufficient size and zoning were identified.

Ford Road Site

The 20-acre site on Ford Road is east of the City of Ukiah. It is immediately adjacent to the old Masonite site. The 20-acre parcel was listed in 2010 for $2,178,000. The site is relatively near several existing residential neighborhoods. Urban residential development occurs about 1,000 feet west, 1,500 feet south, and 2,000 feet east of the sites. In 2004, Hot Rocks proposed an asphalt plant on North State Street less than one mile north of this Ford Road site. That application was not approved by the County due to concerns about noise, air quality, and other impacts to residents in the area. The Draft Minutes of the hearing when the project was denied state, "Several Commissioners expressed that the project was a good project using recycled asphalt but in the wrong location. The Commission supported more separation from residential areas." This site was much closer to residences than the Ford Road sites. However, it is expected that there would be similar concerns from people living in the area about noise and particularly air quality impacts.

Substantive differences in impact of developing an asphalt facility at this location include:

- The site is flat and would not require substantial grading as the proposed project requires.

- The site is within the 100-year floodplain of the Russian River and would need to have fill placed to be above the 100-year flood elevation.

- There would be potential water quality impacts from residues draining from the site given the close proximity of the Russian River, though these impacts could likely be mitigated. The project would need to be carefully designed so that it does not flood and transport pollutants to the river.

- The site does not contain sensitive biological resources.

- Access would be via Ford Road to North State Street and to Highway 101. Aggregate haul trucks would access the site and leave empty to return to whatever quarry is serving the facility, and asphalt haul trucks would travel to and from the site. Intersections along North State Street in this area, including intersection with the Highway 101 ramps are congested. Adding aggregate haul trucks and asphalt haul trucks would exacerbate congestion in this area. In the future access could be via an extension of Orchard Avenue to the north. However, trucks would still need to use North State Street to access Highway 101. This alternative site would have more traffic impacts than the proposed project.

- The site is quite visible from Highway 101 and development of an asphalt plant at this location would have visual impacts on northbound Highway 101 drivers. Currently, views include vacant land on the abandoned Masonite site and open land to the east.

- The site is sufficiently distant from residential development that noise would not be expected to be a significant effect.

- The project would emit air emissions similar to those described from the project. Air quality modeling was not prepared for this site. However, it is likely that at least some local residents will be concerned about these emissions.

- The increased hauling required by this alternative site would increase the emissions of diesel pollutants and greenhouse gases.

- The project would be served by the Ukiah Valley Fire Protection District. The site is not within a water district, so it would need to annex to the Millview County Water District (which is currently under a hookup moratorium) or develop an on-site well.

- The alternative would not conflict with the existing surrounding uses. However, depending on the final Ukiah Valley Area Plan adopted by the County early next year, it could conflict with proposed future uses (including commercial and residential development on the old Masonite site) and residential uses on portions of the Brush Street Triangle to the southwest.

An asphalt facility at this site would substantially decrease project construction impacts. It would eliminate the significant visual impacts, though the impact to views from Highway 101 might remain significant. It appears that the site meets the recommendation of several Planning Commissioners that at the hearing on the site on North State Street that there be a separation of the facility from residences, though whether the separation is sufficient remains speculative. The alternative would substantially increase traffic impacts, due to the need to use the congested North State Street corridor. So, if the County adopts one of the earlier project alternatives that eliminates the asphalt facility from the proposed site, this Ford Road parcel is a site the applicant could consider.

East Willits

There is a 7.1-acre site located on North Lenore Street within the City of Willits. The property was listed in 2010 for $473,500. It is in an industrial area.

The Willits Planning Director has stated that a project that is consistent with the zoning, General Plan, and all other applicable requirements and that satisfies needed environmental findings, would be considered by and could be approved by the City.[122] However, in the past the City has not approved asphalt plant applications within the City. In 1988, Mendocino Paving sought approval of an asphalt plant on Cropley Lane. The plant was heavily protested and an EIR was required. The application was withdrawn. In 1999, Harwood Investments sought approval of a concrete plant on Cropley Lane. The application was withdrawn because the applicant felt the conditions of approval were too expensive to implement.

Calpella

There is an available 18.9-acre site at 6301 North State Street in Calpella. This former lumber yard was listed in 2010 for $1,500,000. While the area to the north and east is used for industrial purposes, the site is immediately opposite residential development to the south and the center of Calpella is about 700 feet to the south. The Waldorf School of Mendocino is 300 feet distant and the Calpella Elementary School is about 1,200 feet distant from the site. The principal advantages of this site is that it is flat and historically has been used for industrial purposes. There would be few impacts associated with developing the site. The site also has excellent access to Highway 101 with primarily vineyards and industrial development along the access road (North State Street). Highway improvements would not be needed to serve the project at this locale.

The principal disadvantages of the site are associated with its proximity to residential, retail commercial, and educational uses. Noise and visual impacts would likely be significant to nearby residents. Emissions of air pollutants and toxic contaminants could be significant given the proximity to residences and schools. It is expected that local residents, schools, and businesses would be quite opposed to such a facility at this site.

[122] Alan Falleri, personal communication, February, 2011.

Highway 101 Right-of-Way

One of the commenters on the original DEIR requested analysis of an alternative that did not include an asphalt plant on the project site. It would include a temporary asphalt facility within the Highway 101 right-of-way to serve the asphalt requirements of constructing the Willits Bypass. This alternative would include County approval of one of the earlier alternatives that did not include the asphalt facility (Alternatives 1, 2, 3, or 6). It is speculative what impacts such a temporary facility would cause, since the location of the facility is unknown. It is possible that a site could be found that meets Cal Trans' access requirements while being distant from sensitive receptors. However, the impacts of developing such a site remains speculative.

c. Conclusions

There is no feasible alternative site for the project as a whole. If the County decided to approve an alternative that did not include the asphalt facility, then there are alternative sites the applicant could seek to purchase and get approval for operation of an asphalt facility. However, all these sites are more urbanized (despite having industrial land use designations) than the proposed site and could result in land use conflicts with residential neighbors living in the area. Development of these sites would have their own environmental effects, including more significant traffic impacts for the possible alternate sites in Willits and Ukiah than for the proposed project site. It is entirely possible that there are other available sites that were not listed on the Multiple Listing Service. However, most land designated Industrial is within or near Ukiah, Calpella, and Willits. In almost all cases, these lands are near existing residential development.[123]

The County could not approve an asphalt plant at any of these sites as part of this EIR. A separate application would need to be submitted, and it would need to undergo its own detailed environmental review. If the County believes that an alternate site for the asphalt plant is preferable, then it can approve one of the earlier alternatives that eliminates the asphalt plant. The earlier discussions indicate that all alternatives that eliminate the asphalt facility are environmentally superior to the proposed project.

8. Comparison of Alternatives

There are 8 alternatives under consideration: the 7 alternatives discussed above and the project as proposed. Table 2-1 presented earlier in this report compares the impact significance for the project and the alternatives.

Alternative 1 (No Project – No Further Development) is the environmentally superior alternative as it eliminates all site-specific impacts and allows immediate reclamation of

[123] A commenter on the original DEIR asked a series of questions about how much effort went into identifying alternative sites. The EIR preparers requested information on available sites from seven local realtors and reviewed the on-line MLS listings for the target area. It is possible that there may be other sites that are available and meet the criteria of size and land use designation. However, CEQA does not require an EIR to identify every possible alternate site. In addition, if other feasible sites are identified during the public review of this DEIR, they will be addressed in the Final EIR.

the existing quarry, even though it would somewhat increase regional traffic, air quality, climate change, and energy use impacts.

CEQA requires that a second environmentally superior alternative be identified if the environmentally superior alternative is the no project alternative (i.e., Alternatives 1 or 2). Alternative 6 (Reduced Production) would be the environmentally superior alternative among the remaining alternatives. Alternative 6 eliminates two of the five potentially significant impacts of the project. It substantially reduces many other impacts, though it would somewhat increase regional traffic, air quality, climate change, and energy use impacts. This alternative meets 1 of the 5 project objectives.

The following list ranks the alternatives. Alternative 1 is environmentally superior while the project as proposed is the least "superior:"

Alternative 1 No Project – No Future Development
Alternative 2 No Project – Future Development Consistent with Land Use Classification
Alternative 6 Reduced Production
Alternative 3 Quarry Only
Alternative 4 Quarry and Temporary Asphalt Plant
Alternative 5 Project Redesign
Project as Proposed

If the County determines that the Alternative Location alternative (Alternative 7) is superior, then it would select one of the other alternatives that eliminates the asphalt plant on the proposed site.

Chapter 6.0

Report Preparers, Bibliography, and Persons Contacted

6.0 REPORT PREPARERS, BIBLIOGRAPHY, AND PERSONS CONTACTED

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Chapter 7.0

Appendix

Appendix A

Proposed Mineral Processing Combining District

Mineral Processing Combining District

Mendocino County Zoning Code Provision Proposed for Adoption

Proposed Amendment to Mendocino County Zoning Code, Chapter 20.040.0.

Sec. 20.040.010 Combining Districts.

In addition to the districts enumerated in Section 20.040.005 combining districts may be established and designated as follows:

"AH" Special Airport Height Combining District;
"C" Cluster Combining District;
"FP" Special Flood Plain Combining District;
"IS" Isolated Service Combining District;
"L" Special Minimum Lot Size Combining District;
"MP" Mineral Processing Combining District:
"PD" Planned Development Combining District;
"P" Plan Combining District;
"SH" Special Hazards Combining District;
"SS" Seismic Study Combining District.

Proposed Amendment to Mendocino County Zoning Code, Chapter 20.036.

Sec. 20.036.010 Mining and Processing.

The mining and processing use type refers to places or plants primarily devoted to surface or subsurface mining of metallic and nonmetallic materials, geothermal development, oil or gas together with essential processing of only nonmetallic mineral products. Except where conducted within a Mineral Processing Combining District, and subject to the requirement for a major use permit, all such processing shall be of a temporary nature and carried on in conjunction with, and only for the duration of a specific construction project (except that portable screening and crushing equipment need not be related to a specific construction project). The sale of additional materials may he allowed for other off-site uses where such materials do not exceed ten percent (10%) of that volume specified for the primary construction project. Typical places or uses include borrow pits, gravel bars, rock quarries, oil and gas drilling rigs, or portable crushing, screening, washing, and mixing plants. (Ord. No. 3639 (part), adopted 1987)

Proposed Additional Sections to Mendocino County Zoning Code, Chapter 20.134.

Sec. 20.134.005 Intent

This combining district is intended to allow, in limited circumstances, the processing of mineral resources near the site of extraction. Since mineral extraction must take place on the physical site where the minerals naturally occur, special controls are needed to minimize conflicts with other land uses. The Mineral Processing Combining District functions as an "overlay district".

Sec. 20.134.010 Regulations for ‘‘MP” Mineral Processing Combining District.

(A) Objectives: The operation of asphalt and concrete batch plants shall he allowed on properties within the Mineral Processing Combining District, subject to the issuance of a major use permit. “Asphalt and concrete batch plants” are defined as machinery used to process raw gravel, sand, and other materials into either hot asphalt or ready—mix concrete. [May retain this definition here or move to another section]

(B) Locational Requirements: The Mineral Processing Combining District shall only be applied to areas with an R-L zoning designation (See Chapter 20.060). The Mineral Processing Combining District shall not be applied to:

(1) Land within any area of special flood hazard established in Section 20.120.010(A),

(2) Land incorporated into Agricultural Preserves under Williamson Act contract.

(C) Designation: The Mineral Processing Combining District shall be designated by the symbol (MP) on the County Land Use Plan.

(D) Development Standards:

(1) The operation of asphalt and concrete batch plants shall be limited to areas within one—half mile of surface mining activities that have vested rights or a permit to mine from the County.

(2) The general building height limitations for R-L districts shall not apply to mineral processing equipment located within a Mineral Processing Combining District. Instead, asphalt silos and other mineral processing equipment are subject to the seventy-five (75) foot height limitation provided in Section 20.1 52.025(C).

(3) When mining activity ceases, the mineral processing use must cease within one year.

(4) When approving an MP overlay the County may include a condition of approval requiring the permittee to remove the MP zoning overlay upon expiration of the mining use permit.

(5) The batch plant site shall be reclaimed.

(E) Required Information: A Mining/Reclamation Plan describing the phasing of reclamation, in relation to the phases of the mining operation, shall be submitted for land areas which are to be included within a Mineral Processing Combining District.

Sec. 20.146.015 Uses Subject to a Use Permit.

In addition to the use types specified as uses subject to a use permit by the zoning district with which the “MP” combining district is combined, the onsite use of asphalt and concrete batch plants shall also be permitted upon issuance of a major use permit.

Proposed Amendments to Mendocino County Zoning Code, Chapter 20.152.

Sec. 20.152.025 Height Exceptions.

(A) Radio and television aerials and antennae, and similar utility structures and necessary mechanical appurtenances for private reception, may be built and used to a height not more than twenty-five (25) feet above the height limit established for the district in which the structures are located, provided, however, that no such structure in excess of the allowable building height shall be used for any commercial or advertising purposes or any communication transmissions. Wind generators and their associated towers may be built and used to a height of one hundred (100) feet as measured from the ground to the highest point of the system.

(B) Additional heights for public utility structures may be permitted upon approval by the Planning Commission. Height limitations provided herein shall not apply to electric transmission lines and towers.

(C) Asphalt silos, and other mineral processing equipment located within Mineral Processing Combining Districts may be built and used to a height not more than seventy-five (75) feet as measured from the ground to the highest point of the equipment.

(D) The above height limitations shall be subject to laws and regulations of the State and Federal Government. And in no case may the height of any of the above structures exceed the airport height restrictions set forth in the "A-H" zoning district. *(Ord. No. 3639 (part), adopted 1987)*

Appendix B

Background Biological Data

Table of Special Status Plants Known to Occur in the Project Area				
Scientific Name **Common Name**	**Status**	**Associated Habitat**	**Blooming period**	**Suitable Habitat In Project Area**
Alisma gramineum Narrow-leaved water-plantain	CNPS; 2.2 S1S2 G5	Marshes and swamps (assorted shallow freshwater) 390 - 1800 meters	June-August	Possible
Arctostaphylos canescens ssp. sonomensis Sonoma manzanita	CNPS; 1B.2 S2.1 G3G4T2	Chaparral, lower montane coniferous forest/ sometimes serpentinite; 180 - 1675 meters	January-June	Possible
Arctostaphylos stanfordiana ssp. raichei Raiche's manzanita	CNPS; 1B.1 S2? G3T2?	chaparral, lower montane coniferous forest (openings)/ rocky, often serpentinite; 450 - 1000 meters	February-April	Possible
Astragalus agnicidus Humboldt milk-vetch	CNPS; 1B.1 State; Endangered S2.1 G2	broadleaved upland forest, North Coast coniferous forest/ openings, disturbed areas/ sometimes; 180 - 800 meters roadsides	April-September	Possible
Boschniakia hookeri Small Groundcone	CNPS; 2.3 S1S2 G5	North coast coniferous forest; 90-885 meters	April-August	Yes
Carex comosa Bristly sedge	CNPS; 2.1 S2? G5	Marshes and swamps (lake margins), wet places, coastal prairie, valley and foothill grassland; 0 - 625 meters	May-September	No
Ceanothus confusus Rincon Ridge ceanothus	CNPS; 1B.1 S2.2 G2	Closed-cone coniferous forest, Chaparral, Cismontane woodland/ volcanic or serpentinite; 75 - 1065 meters	February-June	No
Cryptantha excavate Deep-scarred Cryptantha	CNPS; 1B.3 S2.2 G2	Cismontane woodland (sandy or gravelly); 100-500 meters	April-May	Possible
Erythronium revolutum Coast fawn lily	CNPS; 2.2 S3 G4	Bogs and fens, Broadleaved upland forest, North Coast coniferous forest/ mesic, streambanks 0 - 1325 meters	March-July (Aug)	Possible

Fissidens pauperculus Minute pocket-moss	CNPS; 1B.2 S1 G1G2	North Coast coniferous forest, damp coastal soils 10 - 1024 meters	N/A	Possible
Fritillaria roderickii Roderick's fritillary	CNPS; 1B.1 S1.1 G1Q State; Endangered	Coastal bluff scrub, coastal prairie, valley and foothill grassland 15 - 400 meters	March-May	Possible
Gilia capitata ssp. pacifica Pacific gilia	CNPS; 1B.2 S2.2? G5T3T4	Coastal bluff scrub, coastal prairie, chaparral (openings), valley and foothill grassland; 5 - 869 meters	April-August	Possible
Hemizonia congesta ssp. congesta Pale Yellow Hayfield Tarplant	CNPS; 1B.2 S2S3 G5T2T3	valley and foothill grassland/ sometimes roadsides 20 - 560 meters	April-November	Yes
Hesperolinon adenophyllum glandular western flax	CNPS; 1B.2 S2.3 G2	Chaparral, cismontane woodland, valley and foothill grassland/ serpentinite; 150 - 1315 meters	May-August	Possible
Lasthenia burkei Burke's goldfields	CNPS; 1B.1 S1.1 G1 State; Endangered Federal; Endangered	Meadows and seeps (mesic), vernal pools; 15 - 600 meters	April-June	Possible
Limnanthes bakeri Baker's meadowfoam	CNPS; 1B.1 State; Rare S1.1 G1	Meadows, Marshes and Swamps (freshwater), Valley and foothill grassland (vernally mesic), Vernal pools; 175 - 910 meters	April-May	Possible
Lotus formosissimus Seaside Lotus	CNPS; 4.2 S3.2 G4	Broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, north coast coniferous forest, valley and foothill grassland/wetlands, roadsides. 0-700 meters	March-July	Possible

Monardella villosa ssp. globosa Robust monardella	CNPS; 1B.2 S2.2 G5T2	Broadleaved upland forest (openings), chaparral (openings), cismontane woodland, coastal scrub, valley and foothill grassland; 100 - 915 meters	June-July (August)	Yes
Navarretia leucocephala ssp. bakeri Few-flowered navarretia	CNPS; 1B.1 S2.1 G4T2	Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools/ mesic; 5 -1740 meters	March-July	Possible
Piperia candida White-flowered Rein Orchid	CNPS; 1B.2 S3.2 G3	Broadleafed upland forest, lower montane coniferous forest, north coast coniferous forest/ sometimes serpentinite 30-1310 meters	May-September	Yes
Plagiobothrys lithocaryus Mayacama popcorn-flower	CNPS; 1A SH GH	Valley and foothill grassland, cismontane woodland/ mesic, chaparral; 300 - 450 meters	April-May	Possible
Pleuropogon hooverianus North Coast semaphore grass	CNPS; 1B.1 S1.1 G1 State; Threatened	Broadleaved upland forest, meadows and seeps, North Coast coniferous forest/ open areas, mesic 10 - 671 meters	April-June	Possible
Potamogeton epihydrus ssp. nuttallii Nuttall's pondweed	CNPS; 2.2 S2.2? G5T5	Marshes and swamps (assorted shallow freshwater); 369 - 2172 meters	July-September	No
Sanguisorba officinalis Great burnet	CNPS; 2.2 S2.2 G5?	Bogs and fens, broadleafed upland forest, meadows, marshes and swamps, North Coast coniferous forest, Riparian forest/ often serpentinite 60 - 1400 meters	July-October	No
Thermopsis robusta Robust false lupine	CNPS; 1B.2 S2.2 G2Q	Broadleafed upland forest, North Coast coniferous forest; 150-1500 meters	May-July	Yes
Tracyina rostrata Beaked tracyina	CNPS; 1B.2 S1S2.2 G1G2	cismontane woodland, valley foothill and grassland; 90 - 790 meters	May-June	Yes

Usnea longissima Long-beard lichen	S4.2 G4	North Coast coniferous forest, broadleaved upland forest. Grows in the "Redwood zone" on a variety of trees. 0-610 meters	N/A	Possible
Viburnum ellipticum Oval-leaved viburnum	CNPS; 2.3 S2.3 G5	Chaparral, cismontane woodland, lower montane coniferous forest; 215 - 1400 meters	May-June	Possible
Viola adunca dog violet	N/A	coastal prairie, meadows edges of forest habitats 9-3500 meters	-	No

PLANT Species Observed on the Project Site

Scientific Name	Common Name	Family
Overstory		
Acer macrophyllum	bigleaf maple	*Aceraceae*
Aesculus californica	California Buckeye	*Hippocastanaceae*
Arbutus menziesii	Pacific madrone	*Ericaceae*
Fraxinus latifolia	Oregon ash	*Oleaceae*
Lithocarpus densiflorus var. *densiflorus*	tanoak	*Fagaceae*
Pseudotsuga menziesii var. *menziesii*	Douglas-fir	*Pinaceae*
Quercus agrifolia	California live oak	*Fagaceae*
Quercus garryana	Oregon white oak	*Fagaceae*
Quercus kelloggii	black oak	*Fagaceae*
Quercus wislizenii	interior live oak	Fagaceae
Umbellularia californica	California-bay	*Lauraceae*
Mid-layer		
Adenostoma fasciculatum	chamise	*Asteraceae*
Arctostaphylos manzanita ssp. *glaucescens*	manzanita	*Ericaceae*
Baccharis pilularis	coyote brush	*Asteraceae*
Ceanothus cuneatus var. *cuneatus*	buckbrush	*Rhamnaceae*
Ceanothus integerrimus	deer brush	Rhamnaceae
Cercocarpus betuloides	mountain mahogany	*Rosaceae*
Cornus nuttallii	dogwood	*Cornaceae*
Corylus cornuta	hazelnut	*Betulaceae*
Eriodictyon californicum	yerba santa	*Hydrophyllaceae*
Garrya fremontii	silktassel	*Garryaceae*
Gaultheria shallon	salal	*Ericaceae*
Heteromeles arbutifolia	toyon	*Rosaceae*
Holodiscus discolor	oceanspray	*Rosaceae*
Mimulus aurantiacus	orange bush monkey-flower	*Scrophulariaceae*
Rosa sp.	rose	*Rosaceae*
Salix lasiolepis	willow	*Salicaceae*
Symphoricarpos mollis	creeping snowberry	*Caprifoliaceae*
Toxicodendron diversilobum	poison-oak	*Anacardiaceae*
Vaccinium ovatum	evergreen huckleberry	*Ericaceae*
Vaccinium parvifolium	red huckleberry	*Ericaceae*
Ground-layer		
Achillea millefolium	common yarrow	*Asteraceae*
Adenocaulon bicolor	trail plant	*Asteraceae*
Adiantum aleuticum	five-fingered fern	*Pteridaceae*
Agrostis sp.	bent grass	*Poaceae*
Aira caryophyllea	European hairgrass	*Poaceae*
Aira elegantissima	elegant European hairgrass	*Poaceae*
Allium sp.	onion	*Liliaceae*
Anagallis sp.	pimpernel	*Primulaceae*

Scientific Name	Common Name	Family
Anagallis arvensis	scarlet pimpernel	*Primulaceae*
Anaphalis margaritaceae	pearly everlasting	*Asteraceae*
Anthoxanthum odoratum	sweet vernal grass	*Poaceae*
Asarum caudatum	wild ginger	*Aristolochiaceae*
Athyrium filix-femina	lady fern	*Dryopteridaceae*
Avena fatua	wild oat grass	*Poaceae*
Bellis perennis	English daisy	*Asteraceae*
Berberis nervosa	dwarf Oregon-grape	*Berberidaceae*
Blechnum spicant	deer fern	*Blechnaceae*
Briza maxima	rattlesnake grass	*Poaceae*
Briza minor	rattlesnake grass	*Poaceae*
Bromus diandrus	ripgut grass	*Poaceae*
Bromus hordeaceus	soft chess	*Poaceae*
Calochortus amabilis	golden globelily	*Liliaceae*
Camassia quamash	camas	*Liliaceae*
Cardamine californica	California toothwort or milk maids	*Brassicaceae*
Carex sp.	sedge	*Cyperaceae*
Carex leptopoda	sedge	*Cyperaceae*
Centaurium erythraea	common centaury	*Gentianaceae*
Cerastium arvense	field chickweed	*Caryophyllaceae*
Chlorogalum pomeridianum ssp. *pomeridianum*	soap plant	*Liliaceae*
Cirsium vulgare	bull thistle	*Asteraceae*
Clarkia purpurea ssp. *quadrivulnera*	clarkia	*Onagraceae*
Conium maculatum	Poison hemlock	*Apiaceae*
Convolvulus sp.	bindweed	*Convolvulaceae*
Cynosurus echinatus	hedgehog dogtail grass	*Poaceae*
Cyperus eragrostis	nut-sewdge	*Cyperaceae*
Dactylis glomerata	orchard grass	*Poaceae*
Danthonia californica	California oatgrass	*Poaceae*
Daucus pusillus	American wild carrot	*Apiaceae*
Dichelostemma capitatum ssp. *capitatum*	Blue dicks	*Liliaceae*
Echinochloa crus-galli	Barnyard grass	*Poaceae*
Eleocharis sp.	spikerush	*Cyperaceae*
Elymus aristatus	wild rye	*Poaceae*
Elymus glaucus	bluegrass	*Poaceae*
Equisetum arvense	common horsetail	*Equisetaceae*
Erodium sp.	storksbill	*Geraniaceae*
Euphorbia sp.	spurge	*Euphorbiaceae*
Festuca idahoensis	Idaho fescue	*Poaceae*
Filago gallica	narrow-leaved filago	*Asteraceae*
Fragaria vesca	wood strawberry	*Rosaceae*
Galium sp.	bedstraw	*Rubiaceae*
Geranium dissectum	cut-leaved geranium	*Geraniaceae*
Geranium molle	dovefoot geranium	*Geraniaceae*
Gnaphalium sp.	Cudweed	*Asteraceae*

Scientific Name	Common Name	Family
Hieracium albiflorum	white hawkweed	*Asteraceae*
Hierochloe occidentalis	vanilla grass	*Poaceae*
Holcus lanatus	Velvetgrass	*Poaceae*
Hordeum sp.	Barley	*Poaceae*
Hypochaeris radicata	hairy cat's-ear	*Asteraceae*
Iris douglasiana	Douglas iris	*Iridaceae*
Juncus bolanderi	Bolander's rush	*Juncaceae*
Daucus carota	Queen Anne's lace	Apiaceae
Juncus ensifolius	rush	*Juncaceae*
Juncus bufonius	common toad rush	*Juncaceae*
Juncus effuses	common rush	*Juncaceae*
Juncus patens	rush	*Juncaceae*
Lathyrus vestitus	wood pea	*Fabaceae*
Linanthus bicolor	baby stars	*Polemoniaceae*
Linanthus parviflorus	false babystars	*Polemoniaceae*
Linum bienne	western blue flax	*Linaceae*
Lolium perenne	perennial ryegrass	*Poaceae*
Lonicera hispidula var. *vacillans*	honeysuckle	*Caprifoliaceae*
Lotus corniculatus	birdfoot trefoil	*Fabaceae*
Lotus purshianus var. *purshianus*	Spanish clover	*Fabaceae*
Lythrum hyssopifolia	hyssop loosestrife	*Lythraceae*
Lythrum sp.	loosestrife	*Lythraceae*
Madia exigua	small tarweed	*Asteraceae*
Madia gracilis	slender tarweed	*Asteraceae*
Madia madioides	woodland madia	*Asteraceae*
Madia sativa	madia	*Asteraceae*
Medicago lupulina	bur clover	*Fabaceae*
Melica sp.	Oniongrass	*Poaceae*
Mentha pulegium	pennyroyal	*Lamiaceae*
Navarretia squarrosa	skunkweed	*Polemoniaceae*
Navarretia sp.	navarretia	*Polemoniaceae*
Nemophila heterophylla	small-flowered nemophila	*Hydrophyllaceae*
Osmorhiza occidentalis	sweet ciciely	*Apiaceae*
Oxalis oregano	redwood sorrel	*Oxalidaceae*
Plantago erecta	foothill plantain	*Plantaginaceae*
Plantago lanceolata	English plantain	*Plantaginaceae*
Poa annua	bluegrass	*Poaceae*
Polystichum munitum	sword fern	*Dryopteridaceae*
Polypodium sp.	polypody fern	*Polypodiaceae*
Prunella vulgaris var. *lanceolata*	self-heal	*Lamiaceae*
Pteridium aquilinum var. *pubescens*	western bracken fern	*Dennstaedtiaceae*
Ranunculus californicus	California buttercup	*Ranunculaceae*
Ribes sp.	Gooseberry	*Grossulariaceae*
Rubus discolor	Himalayan blackberry	
Rubus leucodermis	white-stemmed raspberry	*Rosaceae*
Rubus parviflorus	thimbleberry	*Rosaceae*
Rubus ursinus	California blackberry	*Rosaceae*
Rumex acetosella	sheep sorrel	*Polygonaceae*

Scientific Name	Common Name	Family
Rumex sp.	Dock	*Polygonaceae*
Rumex crispus	curly dock	*Polygonaceae*
Sanicula crassicaulis	Pacific snakeroot	*Apiaceae*
Scirpus microcarpus	small-flowered bulrush	*Cyperaceae*
Scutellaria californica	California Skullcap	*Lamiaceae*
Sidalcea diploscypha	fringed sidalcea	*Malvaceae*
Sidalcea malachroides	maple-leaved checkerbloom	*Malvaceae*
Silene gallica	windmill pink or common catchfly	*Caryophyllaceae*
Smilacina racemosa	branched Solomon's seal	*Liliaceae*
Stachys sp.	hedge nettle	*Lamiaceae*
Stellaria media	common chickweed	*Caryophyllaceae*
Trientalis latifolia	Pacific star flower	*Primulaceae*
Trifolium albopurpureum	common Indian clover	*Fabaceae*
Trifolium dubium	little hop clover	*Fabaceae*
Trillium ovatum	western trillium	*Liliaceae*
Trillium sp.	trillium	*Liliaceae*
Trifolium sp.	clover	*Fabaceae*
Typha latifolia	Cattail	*Typhaceae*
Vancouveria hexandra	northern inside-out flower	*Berberidaceae*
Veronica americana	American brooklime	*Scrophulariaceae*
Vicia sp.	vetch	*Fabaceae*
Viola sempervirens	evergreen violet	*Violaceae*
Vulpia myuros var. *hirsuta*	foxtail fescue	*Poaceae*
Whipplea modesta	yerba de selva	*Philadelphaceae*
Woodwardia fimbriata	chain fern	*Blechnaceae*
Wyethia glabra	mule-ears	*Asteraceae*
Zigadenus fremontii var. *fremontii*	Fremont's death camas	*Liliaceae*

APPENDIX D. SPECIAL STATUS WILDLIFE SPECIES

Common Name *Scientific Name*	Status	General Habitat/Special Features/Range	Breeding Season [Peak Activity]	Potential to Occur
Invertebrates				
Pomo Bronze Shoulderband (Snail) *Helminthoglypta arrosa pomoensis*	EN (Mendocino Co.)	Found under redwoods, in heavily-timbered redwood canyons near the coast of Mendocino County, Ca.		N
Fishes				
Chinook Salmon - California Coastal ESU *Oncorhynchus tshawytscha*	FT	Most spawn in the mainstem of large rivers, they will also use smaller streams with sufficient water flow. Spawning generally occurs in shallow riffle areas of main streams or rivers. Optimal temperatures between 10-15° C. Due to their size they are able to spawn in larger gravel than most other salmon.	Fall (Spawning)	N
Coho Salmon - Central California Coast ESU *Oncorhynchus kisutch*	FT SE	Generally spawn in smaller streams than Chinook salmon. Spawning sites are typically at the heads of riffles or tails of pools in loose, silt-free, course gravel with nearby cover for spawning adults. Juveniles prefer deep, well-shaded pools with ample overhead cover, and are often associated with undercut banks, logs, and other woody debris in pools or runs.	Fall (Spawning)	N
Steelhead - Central California Coast DPS *Oncorhynchus mykiss irideus*	FT	Occur in small streams and tributaries with cool, well oxygenated water available year-round. Optimum temperature requirements generally 39-56°F. Mostly use gravel for spawning; must be permeable with minimum sand/silt, to keep eggs well oxygenated. Fry emerge and move to shallow, protected areas of stream margins.	Spring (Spawning)	N
Amphibians				
Foothill Yellow-legged Frog *Rana boylii*	CP, CSSC	A variety of habitats (valley-foothill hardwood, mixed conifer, mixed chaparral, & coastal scrub) with small permanent streams, with a rocky substrate. Feed on aquatic & terrestrial insects & invertebrates. Eggs are attached to emergent vegetation in permanent pools.	March - May	N
Reptiles				
Northwestern Pond Turtle *Clemmys marmorata marmorata*	CP, CSSC, BLM, USFS	A variety of habitats, with permanent or nearly permanent water. Omnivorous, feed on aquatic plant material, invertebrates, fish, frogs. Require basking sites. Eggs deposited in soil with fairly high humidity.		N
Ringneck Snake *Diadophis punctatus*	USFS	Common in open, relatively rocky areas within valley-foothill, mixed chaparral, and annual grass habitats. Forage on the surface and under surface objects taking earthworms, salamanders (especially Slender salamanders (*Batrachoseps*)), treefrogs, small lizards, and small snakes. Use rotting logs, woodpiles, stable talus, and small holes. In courtship, males appear to bite female at neck ring.	April - July (Eggs laid) Aug. - Oct. (Hatching)	L-M

Common Name *Scientific Name*	Status	General Habitat/Special Features/Range	Breeding Season [Peak Activity]	Potential to Occur
Birds				
Osprey *Pandion haliaetus*	CSSC, CDF	Mixed conifer forests with fish-bearing waters, including rivers, lakes, bays, estuaries and surf zones. Prey mostly on fish. Uses large snags and open trees for nesting. Platform stick nests typically located within 1/3-mi. of water.	March - Sept.	N
Golden Eagle *Aquila chrysaetos*	CFP, CSSC, BLM, CDF	Rolling foothills, mountain areas, sage-juniper flats, desert. Prey mostly on lagomorphs and rodents. Needs open terrain for hunting. Nests on cliffs and large trees in open areas.	Jan. - August [March - July]	L
Northern Harrier *Circus cyaneus*	CSSC	Flat or hummocky open areas of tall dense grasses and shrubs. Prey mostly voles, other small mammals, birds, frogs. Hunts from low perches, or by flying close to the ground. Nests on ground in shrubby vegetation, usually at marsh edge.	April - Sept. [June - July]	N-L
Northern Goshawk *Accipiter gentillis*	CSSC, USFS, CDF	Uses dense, mature conifer and deciduous forests, interspersed with meadows, openings, and riparian areas. Nests typically in densest part of a stand; in trees greater than 12-in. diameter and nest generally built below the canopy in fork of large branch. Preferred prey are birds (robin to grouse in size); will prey on small mammals. Snags and dead-topped trees are often used for observation and prey-plucking perches.	April - May	N
Sharp-shinned Hawk *Accipiter striatus*	CSSC	Forested habitats, with nearby openings and water. Nesting occurs in dense even-aged conifer stands; nest typically against trunk or in crotch of large branch, usually within 300-ft. of water. Hunting habitat is woodland openings, hedgerows, brushy pastures and shorelines. Prey mostly birds.	April - August [May - June]	M-H
Cooper's Hawk *Accipiter cooperii*	CSSC	Patchy wooded habitat with nearby water. Usually nest in second-growth conifer stands near streams. Cover is utilized to approach and attack prey; prey mostly birds, small mammals.	March - August [May - July]	M-H
American Peregrine Falcon *Falco peregrinus*	FE, CE, CDF	Uses bodies of water in open areas with cliffs and canyons nearby for cover and nesting. Prey mostly on birds (in flight). Nest is a scrape on depression or ledge in open area. Breeds near wetlands, lakes, rivers or other water sources on high cliffs banks, dunes and mounds. Nests are scrapes on a depression or ledge. Man-made structures used; abandoned raptor nests and tree cavities occasionally used.	March - late Aug.	N-L
Prairie Falcon *Falco mexicanus*	CSSC	Uncommon resident/migrant along the inner Coast Ranges and Sierra Nevada. Perennial grasslands, rangeland, open mountains, and some agricultural fields. Nests in open terrain with canyons, cliffs, & rock outcrops, usually within ¼ mi. of water. Forage in open terrain, on small mammals, birds, reptiles.	Feb. - Sept. [April - August]	L

Common Name ***Scientific Name***	**Status**	**General Habitat/Special Features/Range**	**Breeding Season [Peak Activity]**	**Potential to Occur**
Northern Spotted Owl *Strix occidentalis caurina*	FT, CSSC, BLM, USFS, CDF	Mature multi-layered mixed conifer, redwood and Douglas-fir forests with a permanent water source and suitable nesting sites. Prefer narrow, steep canyons with north-facing slopes. Prey mostly on small mammals. Nests in cavities or broken tops of large trees or snags. A pair may use the same breeding site for 5 to 10 years, although not breed every year. Sensitive to habitat destruction and fragmentation.	March - June [April - May]	N (*NSO #560 located over 1.5-mi. from PA*)
Purple Martin *Progne subis*	CSSC	Rare summer resident in no. CA. Valley foothill, montane hardwood, hardwood-conifer, and riparian habitats. Breeding habitat is old-growth, multi-layered open forests and woodlands with snags. Nests in old woodpecker cavities, human-made structures. Feed on insects, hawked in flight.	April - August [June]	L
California Thrasher *Toxostoma redivivum*	FT	Chaparral habitat and riparian thickets, especially with California blackberry and wild grape, and having dense canopy and openings near ground. Feed mostly on insects, spiders, terrestrial invertebrates. Nest built inside large shrub or scrubby tree.		L
Yellow Warbler *Dendoica petechia*	CSSC	Uncommon to common migrant in northern CA. Open to medium-density woodlands and forests. Deciduous riparian areas, during the breeding season. Feed on insects & spiders. Nest in an open cup, in a deciduous sapling or shrub; tall trees adjacent to nest used for singing and foraging.	April - August [June]	N-L
Yellow-breasted Chat *Icteria virens*	CSSC	Riparian woodland understory habitat, with dense, brushy thickets and tangles near water. Willow thickets used for cover; dense shrubs at ground level, along a stream, are used for nesting. Gleans insects & spiders from shrubs and low tree foliage.	May - August [June]	N-L
Mammals				
Yuma Myotis *Myotis yumanensis*	BLM	Optimal habitats include open forests and woodlands. Closely tied to water for foraging and drinking. Feed on wide variety of small flying insects by echolocation. Roosts in buildings, mines, caves, or crevices. Emerges soon after sunset. Apparently hibernates; probably makes local or short migrations (elevation) to suitable hibernacula.	Fall (Breeding) late-May - June [early June] (Birthing)	L
Long-eared Myotis *Myotis evotis*	BLM	Found in nearly all brush, woodland, and forest habitats from sea level to at least 9,000 ft, but coniferous woodlands and forests are preferred. Feeds over water and open habitat, and uses denser woodlands and forests for cover and reproduction.		L
Western Red Bat *Lasiurus blossevillii*	USFS	Winter along coast; some move inland in summer, where sexes separate zonally. Feeds over a variety of habitats (grassland, shrubland, open woodland, forest, cropland). Summer roost in tree foliage in woodlands and mixed conifer forests. Avoids caves/buildings during summer/winter. Young are born and perch among tree foliage. Not found in desert areas.		L

Common Name ***Scientific Name***	**Status**	**General Habitat/Special Features/Range**	**Breeding Season [Peak Activity]**	**Potential to Occur**
Townsend's Big-eared Bat *Corynorhinus townsendii*	CSSC, BLM, USFS	Mesic habitats, with caves, mines, tunnels or buildings for roosting. Gleans small moths from brush or trees along habitat edges. Very sensitive to disturbance of roosting sites, which are the most critical limiting factor.	Nov. - Feb. (Breeding) May - June (Birthing)	L-M
Pallid Bat *Antrozous pallidus*	CSSC, BLM, USFS	Variety of habitats, including grasslands, shrublands, woodlands, and mixed conifer forests. Roosts in rocky outcrops, cliffs, and crevices. Forages in open habitats, 1-3mi. from day roost, on a variety of large hard-shelled insects & beetles. Very sensitive to disturbance of roosting sites.	Oct. - Feb. (Breeding) April - July [May - June] (Birthing)	L-M
Sonoma Tree Vole *Arborimus pomo*	CSSC	Rare to uncommon; mainly restricted to fog belt along coast from Sonoma Co. to Oregon border. Mature Douglas-fir & montane hardwood conifer forests. Specializes on Douglas-fir & grand fir needles; needle resin ducts are removed, remaining part is eaten. May use resin ducts to line large, dome-shaped nest made of fir needles.		N-L *(Two occurences within 1-mi. of PA)*
Pacific Fisher *Martes pennanti*	CSSC, USFS	Preferred habitat includes large areas of mature, dense conifer forest stands, and deciduous-riparian areas, with snags and greater than 50% canopy cover. Cavities in large trees, snags, logs, rocky areas, & logging slash provide suitable cover; hollow logs and snags are especially important. Prey on rabbits, mice, porcupines, squirrels and mountain beaver.	March - May	N

Appendix C

Background Traffic Data

Background Data on Methodology and Assumptions Used for the Traffic Analysis

1. Projected Local Roadway System Base Traffic Volumes

Caltrans District 1 has projected that volumes on U.S.101 in the project vicinity will grow by 50 percent over the 20-year period from 2006 to 2025. Likewise, County of Mendocino Planning staff has directed that volumes on Black Bart Drive should be projected to grow at the same rate for analysis purposes. The 50 percent growth in traffic was projected to occur by 2025, and year 2010 and 2014 volumes were developed using a straight line growth projection between current and projected 2025 volumes.

Typically, travel demand forecasting is completed for about a 20-year horizon. In the case of U.S.101 within the study area, the most recent forecasting for both Caltrans and the County of Mendocino was completed in 2006, meaning that current projections extend to 2025. A 2030 horizon year has also been developed for analysis purposes, which is beyond current Caltrans and County of Mendocino forecasting and beyond the typical 20-year forecasting horizon. In order to project traffic volumes for 2030, the same annual growth rate was applied that was used to project the 2010 and 2014 volumes. It should be noted that since this is beyond the typical forecasting horizon, the reliability of these projected traffic volumes is unknown and may vary based on changes in area demographics and travel patterns that cannot be accounted for at this time. Base volumes for each horizon year are presented in the W-Trans report.

2. Projected Quarry Base Permit Traffic Volumes

Analysis of future year circulation system operation takes into account the peaking characteristics of both the local roadway traffic volumes as well as traffic levels associated with quarrying operations.

a. Quarry Traffic Seasonal Variation

The primary factor related to the number of truck trips into and out of a quarry facility is the demand for aggregate and AC, which is highly influenced by the season and the level of construction activity. Demand will vary not only monthly, but also from day to day and hour to hour. Based upon input from the applicant as well as EIRs for other quarry expansions, October has the highest level of production – see **Table 1**.

b. Local Roadway Traffic Seasonal Variation

Traffic levels on U.S.101 vary significantly throughout the year. Findings from the closest Caltrans count station to the project site are presented in **Table 2**.

As seen in **Table 2**, the month of July has the highest percentage of annual average traffic volumes. The relationship between the data presented in **Tables 1** and **2** are shown graphically in **Figure 1** and indicates the annual variation in production of the Quarry together with the variations in traffic volumes on U.S.101 as a percentage of average production and volume. Using these relationships, traffic volumes for July and

October were developed based on traffic volume counts conducted near the Quarry entrance.

c. Assumptions to Determine Quarry Truck Levels (Base or Base + Project ("Project"))

i. Bulking Factor

When a solid cubic yard of material is processed, it yields a larger volume of gravel because the gravel is not nearly as compact as a solid rock and contains many air voids, causing the same weight of material to occupy a larger volume. When gravel is processed, it increases in volume by a factor of approximately 1.24 compared to solid rock.

C

ii. Truck Capacity

Truck capacity was based upon a standard truck size of 20 cubic yards; however, due to varying truck size and/or varying demand for transporting gravel or AC, it was assumed that not all loads would be 20 cubic yards, so an average of 16 cubic yards per truck was used for analysis purposes. Since aggregate transferred to Willits for concrete production is expected to be much more consistent, it was assumed that the entire truck capacity of 20 cubic yards would be utilized. The relationships between the data presented in **Tables 1** and **2** are shown in **Figure 3** and indicate the annual variation in production of the Quarry together with the variations in traffic volumes on U.S.101 as a percentage of average production and volume. Using the relationship between average and peak Quarry production, it was determined that there is a 147 percent variance in production between average and peak conditions, or nearly 50 percent higher production during the peak month than on average. Additionally, it was assumed that 25 percent of weekly traffic occurs on a peak day and that there is an average of 4.15 weeks per month, after deducting 11 non-working days a year to account for holidays, inclement weather or closures for other reasons. These factors were based upon data published in EIRs for the Canyon Rock and Blue Rock quarries in Sonoma County. **Table 3** summarizes the factors used to project Quarry truck trips.

Table 1
Monthly Production

Month	Percentage for Year		Month	Percentage for Year	
	Aggregates	AC		Aggregates	AC
January	5.5%	2.0%	July	9.4%	12.0%
February	5.4%	2.0%	August	9.4%	17.0%
March	7.5%	2.0%	September	9.2%	17.0%
April	5.6%	3.0%	October	12.2%	17.0%
May	10.6%	3.0%	November	12.1%	15.0%
June	9.3%	6.0%	December	3.8%	4.0%

Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

Table 2
Summary of Monthly Traffic Volumes at Count Station 109

Month	Average ADT	% of Average Annual ADT	Month	Average ADT	% of Average Annual ADT
January	2826	78.60%	July	4678	130.11%
February	2888	80.30%	August	4514	125.55%
March	3133	87.10%	September	4078	113.42%
April	3458	96.00%	October	3593	99.93%
May	3957	110.10%	November	3139	87.31%
June	4255	118.30%	December	2626	73.04%

Note: ADT = Average Daily Traffic

Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

Table 3
Production Conversion Factors

Unit	Unit Factor
Unit Weight of Mined Material	4,185 lbs/cy or 0.48 cy/ton
Unit Weight of Processed Gravel	3,375 lbs/cy or 0.59 cy/ton
Bulking Factor (Row 1/Row 2)	1.24
Average Truck Capacity Gravel-AC	16 cy/truck
Average Truck Capacity Concrete Aggregate	20 cy/truck
Peak Production Level	1.47 x Average

Notes: cy = cubic yards, lbs = pounds, ton = 2,000 lbs

Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

d. Existing Permit Conditions

For the Quarry to continue operating at its current levels of production, a permit renewal is necessary. To evaluate current production levels, a Base Permit Conditions scenario was prepared to assess the impacts that would be expected under existing permitted aggregate production levels. The Harris Quarry currently operates under a permit allowing extraction of 75,000 cubic yards of material annually, resulting in 93,000 cubic yards per year of material hauled from the site after taking into account changes in volume associated with crushing the rock. Base average and peak daily truck generation assumptions were based on the projected Quarry production for the months of July, which experiences the highest average traffic volume on U.S.101, and for October when U.S.101 experiences average traffic flows. Within each of these months, peak production for the Quarry was assumed to be 147 percent of the average. Since the Quarry is not expected to operate on weekends and will be occasionally closed for

holidays or due to inclement weather, operation was based on 21 operating days per month. Average truck capacities of 16 cubic yards for aggregate and AC were used for the analysis.

Based upon this production level and the monthly production factors presented in **Table 1**, hourly truck trips into and out of the Harris Quarry site were projected for the average and peak July and October periods (see **Table 4**). These truck trips were determined by calculating the total production in a day, and distributing that amount throughout the day in a logical manner based on normal construction activity and demand for aggregate. During peak production, one trip from each resource, such as fuel and asphalt oil, as well as delivery services such as the postal service, UPS and FedEx were projected to occur on any given day with as many as two deliveries arriving during a single hour. To ensure a conservative analysis, one inbound and one outbound truck trip were added to each hour between 7:00 AM and 4:00 PM. Turning movements at the project access are shown in the W-Trans study. As shown in **Table 4**, it is projected that Harris Quarry at the currently permitted 75,000 cubic yards of mixed material would generate 84 two-way truck trips on an average day in July (42 in and 42 out), with 114 two-way truck trips during a peak day in July (57 in and 57 out). In October, Harris Quarry would generate an average of 104 two-way truck trips per day (52 in and 52 out), with 150 two-way truck trips on a peak day (75 in and 75 out). The base permit levels were used to analyze traffic impacts that would be expected if the Quarry production was limited to the permit amount, rather than using historical actual quarry production.

Table 4
Truck Trips for Permitted Production (75,000 cy Mined)

Time	July				October			
	Average Day		Peak Day		Average Day		Peak Day	
	In	Out	In	Out	In	Out	In	Out
6:00 – 7:00 AM	0	0	1	0	1	0	1	0
7:00 – 8:00 AM	4	4	5	6	5	6	7	8
8:00 – 9:00 AM	5	5	7	7	6	6	9	9
9:00 – 10:00 AM	5	5	7	7	6	6	9	9
10:00 – 11:00 AM	5	5	7	7	6	6	9	9
11:00 AM – Noon	5	5	7	7	6	6	9	9
Noon – 1:00 PM	4	4	6	6	5	5	8	8
1:00 – 2:00 PM	4	4	5	5	5	5	7	7
2:00 – 3:00 PM	4	4	5	5	5	5	7	7
3:00 – 4:00 PM	4	4	5	5	5	5	7	7
4:00 – 5:00 PM	2	2	2	2	2	2	2	2
5:00 – 6:00 PM	0	0	0	0	0	0	0	0
Total Trips	**42**	**42**	**57**	**57**	**52**	**52**	**75**	**75**

Source: W-Trans Updated Supplemental Traffic Impact Analysis for the Harris Quarry, January 27, 2010

Employees are generally expected to arrive at approximately 6:00 AM and leave at approximately 5:00 PM. Under existing conditions, the Quarry employs 8 people. Due to the relatively long distance from commercial areas, it is expected that few employees will leave the site for a lunch break; however, to provide a conservative analysis, it was assumed that up to half of the employees leave and return during the noon hour for a lunch break. Since employees are expected to arrive outside of a peak analysis period, their inbound trips in the morning and two-way lunch break trips were not included in the analysis, but employees are expected to leave during the 4:45 to 5:45 PM analysis period, so a total of 8 outbound personal vehicle trips was added to that analysis period.

3. Speed Change Lanes

a. Warrant Methodology

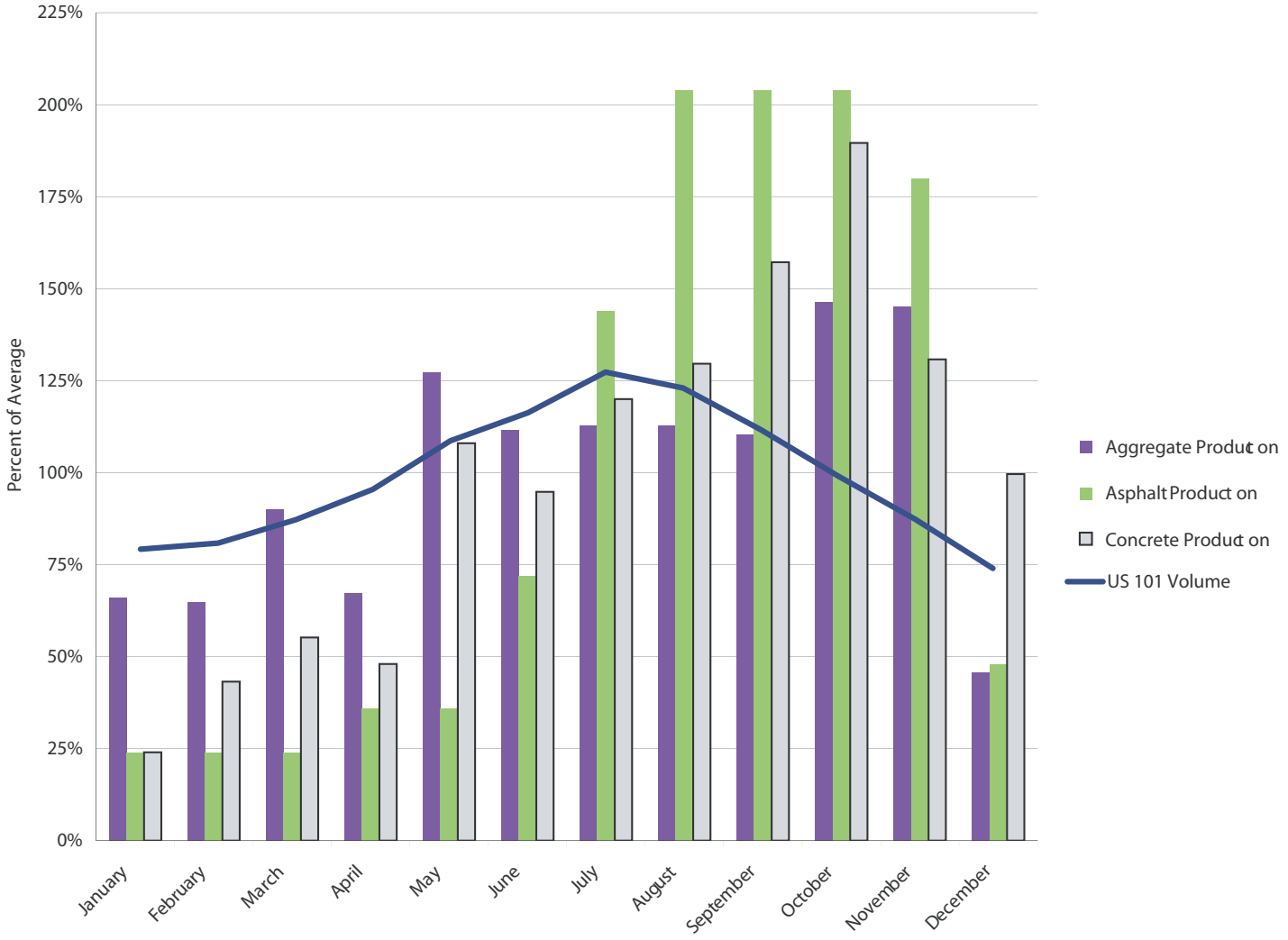
The need for turn acceleration and/or deceleration speed change lanes on U.S.101 was evaluated based on recommendations of Larson and Mannering for the Washington State Transportation Center (TRAC), as contained in their report, “Method for Prioritizing Intersection Improvements” (1997). The authors performed analysis and review of several differing methodologies and found that the 1991 “Modified Harmelink” model developed by Kikuchi and Chakroborty yielded the most reliable and appropriate recommendations. These calculations are based upon passenger vehicles, which make up the vast majority of vehicles on the roadway; for trucks turning at the project driveway the above-described passenger car equivalents were used. The need for speed change acceleration lanes was determined using the same warrant methodology

The following pages include the following prepared by W-trans for the applicant"

1. The January 27, 2010 "Updated Supplemental Traffic Impact Analysis for the Harris Quarry" that was prepared for the applicant.

2. The April 7, 2010 "Addendum to the Updated Supplemental Traffic Impact Analysis for the Harris Quarry."

3. A Februay 2011 Erratum to the reports.



Updated Supplemental Traffic Impact Analysis for the Harris Quarry

County of Mendocino

Figure 3

Monthly Variations

Introduction and Setting

Introduction

This report provides an analysis of the impacts on the circulation system associated with the proposed project at Harris Quarry which is located in Mendocino County south of the City of Willits. This analysis is an update to a report that supplements the Draft Environmental Impact Report (DEIR) for the Harris Quarry Use Permit and reflects conditions with the continuation of existing aggregate hauling activities from the Quarry for the horizon years of 2010, 2014 (both with and without the US 101 Willits bypass construction project in progress), 2030 and 2040. For each horizon year project traffic impacts have been determined for peak production activity in July and October respectively. Impacts have been evaluated for the peak traffic hours on US 101 (Redwood Highway) for the time periods of 9:00 to 10:00 a.m., 11:00 a.m. to noon, 1:15 to 2:15 p.m. and 4:45 to 5:45 p.m. Harris Quarry currently operates on weekdays with no regular operations projected for week nights or weekends. On rare occasions there may be overnight or weekend operations, but this would only occur when there is an emergency need for aggregate. Measures have been identified to mitigate significant impacts of the proposed project. New information provided in this update includes analysis for the horizon years of 2030 and 2040 as well as conditions that would be expected to occur if the quarry production was limited to currently permitted levels, regardless of actual historical production levels, and without the asphalt concrete (AC) plant which is part of the proposed project. Additionally, an analysis of vehicle miles traveled was completed and included. The traffic study was completed in accordance with criteria established by the County and the State, and is consistent with standard traffic engineering techniques. Issues such as intersection level of service, sight distance and safety were evaluated.

Setting

Quarry Location and Access

Harris Quarry is located on the west side of US 101 approximately 500 feet south of Black Bart Drive, south of the City of Willits in Mendocino County. Access to the Quarry is currently provided via a single access drive on the west side of US 101. There are no intersection controls along US 101, with stop sign controls on the side streets. The project site and study intersections are shown on Figure 1.

US 101 in the project vicinity has two travel lanes in each direction. It is an expressway and has at-grade intersections with some local roads and major driveways. US 101 is classified as “rural – other principal arterial” in the Federal Highway Administration (FHWA) functional classification system and is shown in the California Department of Transportation (Caltrans) “California Roads System Maps.” The posted speed limit in the project area is 65 miles per hour (mph). US 101 has a moderate extended uphill grade south to north as it climbs out of the Ukiah Valley. It crests the mountain ridge separating the Russian River and Eel River watersheds just north of the intersection with Black Bart Drive. Northbound US 101 traffic is climbing an uphill grade through both the Harris Quarry and Black Bart Drive intersections, while southbound traffic is on a downhill grade through both intersections. No left or right turn deceleration or acceleration lanes currently exist on the US 101 approaches to the Harris Quarry entrance.

Black Bart Drive is a two-lane rural road extending to the west of US 101. It has a moderate east-to-west uphill grade, numerous horizontal curves and lacks shoulders in most locations. Black Bart Drive is stop-sign controlled on its single lane approach to US 101, and flares out at the intersection to permit a right turning motorist to bypass vehicles making left turns. Left and right turn deceleration lanes are provided on both US 101 approaches to the Black Bart Drive intersection, where all turn movements are also allowed; however, left and right turn acceleration lanes are not provided leaving Black Bart Drive. Land use along Black Bart Drive consists of single family residences. Although traffic from the Quarry is not expected to travel

on Black Bart Drive, the street was included in the analysis due to its proximity to the Quarry entrance and the fact that accelerating or decelerating trucks will interact with vehicles entering or exiting Black Bart Drive.

Planned Improvements

There are currently no planned improvements to Black Bart Drive or the US 101/Black Bart Drive intersection by the Mendocino County Department of Transportation or Caltrans. The nearest planned and funded project is the Willits bypass which will start approximately three miles to the north of the Harris Quarry Driveway. This project has an estimated construction start date of January 2011 and is expected completion in 2015. This is relevant because if Harris Quarry is selected to provide the aggregate for the project, the distribution of truck trips entering or exiting the Quarry is expected to shift, with more trucks traveling north to the bypass project site. This project is not expected to alter the total number of trucks entering and exiting the Quarry.

Segment Speed

The prevailing speed of traffic on US 101 is an essential factor in determining the level of improvements needed at an intersection. The posted speed limit on US 101 is 65 miles per hour in the vicinity of the Harris Quarry access. Vehicle speeds were sampled on US 101 southerly of Black Bart Drive on March 11, 2008, during which time data were collected in both directions, northbound and southbound, as well as by inside, number one, and outside, number two, lanes. Table 1 summarizes statistics of the vehicle speeds measured, and speed survey spreadsheets are provided in Appendix A.

Table 1
Summary of Vehicle Speeds on US 101

	Northbound		**Southbound**	
	Inside	**Outside**	**Inside**	**Outside**
Average Speed	66	61	65	60
85th Percentile Speed	70	65	70	66
Pace Speed	60-69	57-66	60-69	58-67
Number Observed	28	67	35	64

Note: All speeds in miles per hour (mph)

As can be seen in Table 1, the inside, or number one, lane had recorded vehicle speeds approximately five miles per hour faster than those observed in the outside, or number two, lane. This is expected as slower traffic is required to drive in the outer lane. The 85th percentile of observed speeds is often used to establish the speed limit; however, due to the type of facility, the California Vehicle Code (CVC) limits the speed limit to be not more than 65 miles per hour (CVC _22349). The speed sample was obtained at the location of the Quarry driveway because in some situations the free flow speed of a roadway may exceed the speed limit defined by the CVC. For the purposes of this evaluation, a free flow speed of 65 miles per hour was deemed appropriate for evaluating the need for speed change lanes.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated for the one-mile segment of US 101 extending one-half mile in either direction from Black Bart Drive based on the most recent records available from the California Highway Patrol and published in their Statewide Integrated Traffic Records System (SWITRS) reports (January 2004 through December 2008). For the five-year study period, the corridor experienced 16 collisions, translating to a calculated collision rate of 0.52 collisions per million vehicle miles (c/mvm). This is less than the statewide average

of 1.65 c/mvm for similar facilities statewide, as indicated in *2007 Accident Data on California State Highways*, California Department of Transportation. One collision, or 6.3 percent of all reported collisions, resulted in a fatality, which is greater than the statewide average of 2.2 percent for similar facilities. However, the 31.3 percent of collisions that resulted in one or more injuries is less than the statewide average of 38.4 percent for similar facilities. Details of the collision data are provided in Appendix B.

The collision data was further examined to determine which collisions, if any, can be attributed to turning movements at the Harris Quarry Driveway. None of the collisions within the study segment were identified as involving large trucks or trucks with trailers. Additionally, none of the collisions during the five-year period were associated with a turning movement at the project driveway.

Analysis

Base Permit Traffic Volumes

Base turning movement counts at Black Bart Drive and the Harris Quarry access road were taken from the *Draft Environmental Impact Report for the Proposed Harris Quarry Use Permit and Reclamation Plan*, Leonard Charles and Associates (DEIR).

The primary factor related to the number of truck trips into and out of a quarry facility is the demand for aggregate and AC, which is highly influenced by the season and the level of construction activity. Demand will vary not only monthly, but also from day to day and hour to hour. To determine the seasonal truck trip generation from the site production estimates for each product were obtained from the quarry operator. Recently published environmental impact reports for the Canyon Rock and Blue Rock Quarries in Sonoma County were also reviewed. From the EIRs for the Canyon Rock and Blue Rock Quarries seasonal, weekly, peak daily and hourly production information was obtained. Table 2 summarizes the projected monthly production as a percent of the total annual production. As can be seen in Table 2, October has the highest level of production.

Table 2
Monthly Production

Month	Percentage for Year		Month	Percentage for Year	
	Aggregates	AC		Aggregates	AC
January	5.5%	2.0%	July	9.4%	12.0%
February	5.4%	2.0%	August	9.4%	17.0%
March	7.5%	2.0%	September	9.2%	17.0%
April	5.6%	3.0%	October	12.2%	17.0%
May	10.6%	3.0%	November	12.1%	15.0%
June	9.3%	6.0%	December	3.8%	4.0%

An important factor to be considered when determining potential traffic impacts of land uses with seasonal variations is the traffic volume on the adjacent street network. Caltrans maintains permanent volume count stations on various routes throughout the state and these figures are published monthly. The nearest count station location on US 101 is in Humboldt County, and the monthly variations in volumes are summarized in Table 3.

Table 3
Summary of Monthly Traffic Volumes at Count Station 109

Month	Average ADT	% of Average Annual ADT	Month	Average ADT	% of Average Annual ADT
January	2826	78.60%	July	4678	130.11%
February	2888	80.30%	August	4514	125.55%
March	3133	87.10%	September	4078	113.42%
April	3458	96.00%	October	3593	99.93%
May	3957	110.10%	November	3139	87.31%
June	4255	118.30%	December	2626	73.04%

Note: ADT = Average Daily Traffic

As seen in Table 3, the month of July has the highest percentage of annual average traffic volumes. The relationship between the data presented in Tables 2 and 3 are shown graphically in Figure 2 and indicates the annual variation in production of the Quarry together with the variations in traffic volumes on US 101 as a percentage of average production and volume. Using these relationships, traffic volumes for July and October were developed based on traffic volume counts conducted near the Quarry entrance. Although these counts were obtained

some distance north of the project area, the annual distribution of the trips is expected to be similar, making this data appropriate for the purpose of developing these ratios.

Base Assumptions

Several factors were considered when projecting truck trips to and from the Harris Quarry. A primary factor is the bulking that occurs when material is mined. For example, a solid cubic yard block of material when processed yields a larger volume of gravel because when the gravel is processed, it is not nearly as compact as a solid rock and contains many air voids, causing the same weight of material to occupy a larger volume. When the gravel is processed, it increases in volume by a factor of approximately 1.24 compared to solid rock. This factor was derived by dividing a typical unit weight of processed gravel by a typical unit weight of mined material.

The capacity of the truck will determine the number of trucks needed to haul a given quantity of material. Truck capacity was based upon a standard truck size of 20 cubic yards; however, due to varying truck size and/or varying demand for transporting gravel or AC it was assumed that not all loads would be 20 cubic yards, so an average of 16 cubic yards per truck was used for analysis purposes. Since aggregate transferred to Willits for concrete production is expected to be much more consistent, it was assumed that the entire truck capacity of 20 cubic yards would be utilized. The relationships between the data presented in Tables 2 and 3 are shown in Figure 2 and indicate the annual variation in production of the Quarry together with the variations in traffic volumes on US 101 as a percentage of average production and volume. Using the relationship between average production and peak Quarry production as shown on Page 7 of the DEIR it was determined that there is a 147 percent variance in production between average and peak conditions, or nearly 50 percent higher production during the peak month than on average. This ratio is consistent with expected typical traffic patterns experienced by various types of developments, therefore it is reasonable to conclude that during peak construction periods there will be times when the production of the Quarry will be increased by approximately 50 percent to meet these demands. Additionally, it was assumed that 25 percent of weekly traffic occurs on a peak day and that there is an average of 4.15 weeks per month after deducting eleven non-working days a year to account for holidays, inclement weather or closures for other reasons. These factors were based upon data published in EIRs for the Canyon Rock and Blue Rock Quarries in Sonoma County. Summarized in Table 4 are the factors used to project truck trips.

Table 4
Production Conversion Factors

Unit	Unit Factor
Unit Weight of Mined Material	4,185 lbs/cy or 0.48 cy/ton
Unit Weight of Processed Gravel	3,375 lbs/cy or 0.59 cy/ton
Bulking Factor (Row 1/Row 2)	1.24
Average Truck Capacity Gravel-AC	16 cy/truck
Average Truck Capacity Concrete Aggregate	20 cy/truck
Peak Production Level	1.47 x Average

Notes: cy = cubic yards, lbs = pounds, ton = 2,000 lbs

Existing Permit Conditions

For the Quarry to continue operating at its current levels of production, a permit renewal is necessary. To evaluate current production levels a Base Permit Conditions scenario was prepared to assess the impacts and mitigation measures needed under existing permitted aggregate production levels. The Harris Quarry currently operates under a permit allowing extraction of 75,000 cubic yards of material annually, resulting in 93,000 cubic yards per year of material hauled from the site after taking into account changes in volume associated with

crushing the rock. Generally, the anticipated trip generation for proposed projects is estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation*, 8th Edition, 2008. However, the publication does not contain information for quarries or similar developments, so assumptions were developed for use in determining average daily and peak daily truck volumes. These assumptions were based on the projected Quarry production for the months of July, which experiences 130.11 percent of the average traffic volume on US 101 and October, during which the highway experiences average traffic flows. Within each of these months, peak production for the Quarry was assumed to be 147 percent of the average. Since the Quarry is not expected to operate on weekends and will be occasionally closed for holidays or due to inclement weather, operation was based on 21 operating days per month. Average truck capacities of 16 cubic yards for aggregate and AC were used for the analysis. Details of the assumptions applied and copies of the calculation are provided in Appendix C.

Based upon this production level and the monthly production factors presented in Table 2, hourly truck trips into and out of the Harris Quarry site were projected for the average and peak July and October periods. These truck trips were determined by calculating the total production in a day, and distributing that amount throughout the day in a logical manner based on normal construction activity and demand for aggregate. During peak production one trip from each resource, such as fuel and asphalt oil, as well as delivery services such as the Postal Service, UPS and FedEx can be expected on any given day and as many a two deliveries could arrive during a single hour. To ensure a conservative analysis, one inbound and one outbound truck trip were added to each hour between 7:00 a.m. and 4:00 p.m. Truck trips on an hourly basis under Existing Permit Conditions are indicated in Appendix D and turning movements at the project access are shown in Appendix E. As shown in Table 5, it is projected that the Harris Quarry currently generates 84 truck trips on an average day in July and 114 truck trips during a peak day in July. In October, Harris generates an average of 104 truck trips per day, with 150 truck trips on a peak day. The base permit levels were used to analyze traffic impacts that would be expected if the quarry production was limited to the permit amount, rather than using historical actual quarry production.

Table 5
Truck Trips for Permitted Production (75,000 cy Mined)

Time	**July**				**October**			
	Average Day		**Peak Day**		**Average Day**		**Peak Day**	
	In	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
6:00 – 7:00 AM	0	0	1	0	1	0	1	0
7:00 – 8:00 AM	4	4	5	6	5	6	7	8
8:00 – 9:00 AM	5	5	7	7	6	6	9	9
9:00 – 10:00 AM	5	5	7	7	6	6	9	9
10:00 – 11:00 AM	5	5	7	7	6	6	9	9
11:00 AM – Noon	5	5	7	7	6	6	9	9
Noon – 1:00 PM	4	4	6	6	5	5	8	8
1:00 – 2:00 PM	4	4	5	5	5	5	7	7
2:00 – 3:00 PM	4	4	5	5	5	5	7	7
3:00 – 4:00 PM	4	4	5	5	5	5	7	7
4:00 – 5:00 PM	2	2	2	2	2	2	2	2
5:00 – 6:00 PM	0	0	0	0	0	0	0	0
Total Trips	**42**	**42**	**57**	**57**	**52**	**52**	**75**	**75**

Employees are generally expected to arrive at approximately 7:00 a.m. and leave at approximately 5:00 p.m. Under existing operations, the quarry employs eight people. Due to the relatively long distance from commercial areas, it is expected that few employees will leave the site for a lunch break; however, to provide a conservative analysis, it was assumed that up to half of the employees leave and return during the noon hour for a lunch break. This is

consistent with standard employee trip generation estimates of three trips per employee per day. Since employees are expected to arrive outside of a peak analysis period, their inbound trips in the morning and two-way lunch break trips were not included in the analysis, but employees are expected to leave during the 4:45 p.m. to 5:45 p.m. analysis period, so a total of eight outbound personal vehicle trips were added to that analysis period.

Project Trip Generation

The Harris Quarry project would allow the permitted annual extraction to increase to 200,000 cubic yards and adds an AC batch plant capable of producing 150,000 tons annually. The project proposal also includes the importation of 10,000 cubic yards of concrete and AC annually for recycling. While the project proposal includes importation of 10,000 *tons* of material for recycling, the analysis was based on importation of 10,000 *cubic yards*. Since 10,000 tons of material for recycling is expected to yield approximately 5,000 to 6,000 cubic yards of material, the analysis was based on a considerably higher volume of recycling material, so provides conservative results of the project's truck trip generation and actual potential impacts. Additionally, while it is anticipated that the imported material will be brought in on trucks that will be used to export other material, therefore resulting in no additional trips, to provide a conservative analysis it was assumed that the recycle material imported will come in on trucks that will then leave the site empty. Once processed, the recycled material will be exported as part of the aggregate for sale. Additional assumptions specific to each product type and the two peak months are shown in Table 6.

Table 6
Trip Generation Assumptions with Proposed Project

Source	**Annual Production**	**Percent of Annual in:**	
		July	**October**
Material Mined	200,000 cy	n/a	n/a
Recycle Material Imported	10,000 cy	9.4%	12.2%
Aggregate Production For Sale	162,520 cy	9.4%	12.2%
Aggregate transferred to Willits for PCC	37,200 cy	10.0%	15.8%
AC Production	58,280 cy	12.0%	17.0%
Total Production	**258,000 cy**		

In addition, the Quarry will generate truck trips for deliveries as well as clients or other quarry visitors who will arrive by personal vehicle. As with the Base Permit conditions, one inbound and one outbound truck trip was added to each hour between 7:00 a.m. and 4:00 p.m. to account for delivery of goods or other services. This is expected to provide a conservative analysis as it would result in a greater number of delivery trucks than would be expected in a typical month. Using the assumptions indicated, trips on the average weekday and monthly peak day were derived for the months of July and October. An average of 214 truck trips and a peak of 310 daily truck trips are expected during the month of July. For October, 286 truck trips are expected on average, while 412 truck trips would be expected on a peak day.

Construction activities typically begin in the morning between 7:00 and 8:00 a.m., reaching peak activity near 9:00 a.m. This peak continues until about noon, then reduces slightly until 3:30 or 4:00 p.m. Limited quarry activity occurs after 4:00 p.m. and none after 5:00 p.m. Using the hourly trend data from the EIRs for the Canyon Rock and Blue Rock Quarries in Sonoma County, hourly truck trips were projected for the average and peak days in July and October. Table 7 summarizes the projected truck trips entering and leaving the Harris Quarry during these peak months. Project Conditions truck trips by hour are provided in Appendix D and turning movements at the project access are provided in Appendix E. On occasion, the quarry operates overnight or on weekends due to an urgent need for AC or aggregate, usually due to a natural disaster, or to satisfy the need for AC or aggregate for overnight road work as requested by Caltrans or other governmental agency. Since overnight and weekend operations are rare

and do not represent typical operations, they were not included in this analysis. Details of the assumptions applied and the calculation are located in Appendix C.

Table 7
Projected Truck Trips for Project Production (200,000 cy Mined)

Time	Aggregate				AC				Transfer to Willits				Other Trucks			
	Average Day		Peak Day		Average Day		Peak Day		Average Day		Peak Day		Average Day		Peak Day	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
July																
6:00 – 7:00 AM	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:00 – 8:00 AM	6	6	8	9	4	3	4	3	2	1	2	1	1	1	1	1
8:00 – 9:00 AM	7	7	11	11	3	3	5	4	2	1	2	1	1	1	1	1
9:00 – 10:00 AM	7	7	11	11	3	3	5	5	1	1	2	2	1	1	1	1
10:00 – 11:00 AM	7	7	11	11	3	3	5	5	1	1	2	2	1	1	1	1
11:00 AM – Noon	7	7	11	11	3	3	5	5	1	1	2	2	1	1	1	1
Noon – 1:00 PM	6	6	10	10	3	3	4	4	1	1	2	2	1	1	1	1
1:00 – 2:00 PM	6	6	8	8	2	2	4	4	1	1	2	2	1	1	1	1
2:00 – 3:00 PM	6	6	8	8	2	2	3	4	1	1	2	2	1	1	1	1
3:00 – 4:00 PM	6	6	8	8	2	2	3	4	1	2	1	2	1	1	1	1
4:00 – 5:00 PM	2	3	3	3	1	2	0	1	0	1	0	1	0	0	0	0
5:00 – 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total July Trips	**61**	**61**	**90**	**90**	**26**	**26**	**39**	**39**	**11**	**11**	**17**	**17**	**9**	**9**	**9**	**9**
October																
6:00 – 7:00 AM	1	0	2	0	2	0	1	0	0	0	0	0	0	0	0	0
7:00 – 8:00 AM	7	8	11	11	4	4	5	5	2	1	3	3	1	1	1	1
8:00 – 9:00 AM	10	10	14	14	5	4	7	6	2	2	4	3	1	1	1	1
9:00 – 10:00 AM	10	10	14	14	4	4	7	7	2	2	3	3	1	1	1	1
10:00 – 11:00 AM	10	10	14	14	4	4	7	7	2	2	3	3	1	1	1	1
11:00 AM – Noon	10	10	14	14	4	4	7	7	2	2	3	3	1	1	1	1
Noon – 1:00 PM	8	8	12	12	4	4	6	6	2	2	3	3	1	1	1	1
1:00 – 2:00 PM	7	7	11	11	3	3	5	5	2	2	2	2	1	1	1	1
2:00 – 3:00 PM	7	7	11	11	3	4	5	5	2	2	2	2	1	1	1	1
3:00 – 4:00 PM	7	7	10	11	3	4	4	5	2	2	2	2	1	1	1	1
4:00 – 5:00 PM	2	2	3	4	1	2	1	2	0	1	1	2	0	0	0	0
5:00 – 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total October Trips	**79**	**79**	**116**	**116**	**37**	**37**	**55**	**55**	**18**	**18**	**26**	**26**	**9**	**9**	**9**	**9**

As with existing conditions, employees are generally expected to arrive at approximately 7:00 a.m. and leave at approximately 5:00 p.m. Under the proposed expansion, the quarry is expected to employ eleven people during typical operations. As was assumed for Base Permit conditions, though most employees are not expected to leave the site for a lunch break it was conservatively assumed that half of the employees will leave and return during the noon hour. Since employees are expected to arrive and take lunch breaks outside of an analysis period their inbound trips in the morning and round trips at lunch time were not included in the analysis. Employees are expected to leave during the 4:45 p.m. to 5:45 p.m. analysis period, so a total of eleven outbound personal vehicle trips was added during that interval. Any non-standard employee trips during the day can be accounted for in the conservative delivery truck projections.

Projected Traffic Volumes

Caltrans District 1 has projected that volumes on US 101 in the project vicinity will grow by 50 percent over the 20-year period from 2006 to 2025. Likewise, County of Mendocino Planning staff has directed that volumes on Black Bart Drive should be projected to grow at the same rate for analysis purposes. The 50 percent growth in traffic was projected to occur by 2025, while

year 2010 and 2014 volumes were developed using a straight line growth projection between current and projected 2025 volumes.

Typically, travel demand forecasting is completed for about a 20-year horizon. In the case of US 101 within the study area, the most recent forecasting for both Caltrans and the County of Mendocino was completed in 2006, meaning that current projections extend to 2025. The 2030 and 2040 horizon years are therefore beyond current Caltrans and County of Mendocino forecasting and beyond the typical 20-year forecasting horizon. In order to project traffic volumes for 2030 and 2040, the same annual growth rate was applied that was used to project the 2010 and 2014 volumes. It should be noted that since this is beyond the typical forecasting horizon, the reliability of these projected traffic volumes is unknown and may vary based on changes in area demographics and travel patterns that cannot be accounted for at this time.

Vehicle Miles Traveled

Vehicle miles traveled (VMT) is the measure of the total miles traveled by residents, costumers, employees and delivery of goods from a source location, and is typically calculated on an annual basis. VMT also serves as a measure of the broader potential impacts of vehicle travel on an area wide circulation system and correspondingly relates to fuel consumption and vehicle emissions, including greenhouse gases.

The demand for aggregates is a function of population and will increase with population; this relationship is recognized in Section 8.3 of the *Mendocino County General Plan Update Background Report*. From day to day, month to month and year to year there will be variations in project trips depending upon locations of major construction projects, and over time the demand for aggregates will follow population patterns in the County. The demand for aggregates will be met by a combination of quarries and mines currently operating within Mendocino County and neighboring Humboldt, Lake and Sonoma Counties.

Using the Mendocino County General Plan Update Growth Projections for incorporated cities and adjacent environs, population centers or sub-areas were identified and the distance from the operating quarries to the center of each sub-area was determined. Standard gravitational model theory indicates that the portion of total project trips to a sub-area is proportional to the population of the sub-area and inversely proportional to the square of the total trip distance. Based on this theory quarries would be expected to provide more aggregate to population centers that are closer to the quarry and correspondingly fewer trips to population centers of equal size that are further away. Likewise larger population sub-areas will have a greater demand potential than smaller sub-areas and will attract more trips. For analysis purposes, it was necessary to hold demand equal over all scenarios to provide a common point of comparison. Applying this theory, the number of trips and VMT from each quarry and AC plant to each population center fulfilling the demand for aggregate and AC within the County was calculated. In the case of VMT for AC distribution the addition of a third AC plant in the County significantly changes the dynamics of AC related VMT. The VMT gravity model was conducted for aggregate and AC production only and not for concrete production. Calculations are provided in Appendix F.

It is projected for Base Permit conditions that all supplying quarries will make a combined total of approximately 38,900 truck haul trips per year with a combined total of approximately 2.45 million miles traveled to provide aggregate within Mendocino County. With the increased production potential of the Harris Quarry to 200,000 cubic yards of material mined, assuming that the demand for aggregate remains constant, it is projected that the total of truck hauls made countywide by all supplying quarries will remain constant at approximately 38,900 truck haul trips per year. There is a slight difference of four truck trips per year between the two scenarios which is attributed to rounding in the calculations and accounts for about one-hundredth of one percent of all trips, so for the purpose of analysis these values are considered to be equal. The increased production of the Harris Quarry project will not reduce the number of

haul trips but will result in approximately 2.42 million vehicle miles traveled annually from all quarries and will result in 30,490 fewer VMT by aggregate haul trucks. Although the number of aggregate haul trips is equivalent, the total VMT decreases because the Harris Quarry is closer to major population centers and geographical centers of the County, resulting in shorter trip lengths and correspondingly fewer vehicle miles traveled to transport the same amount of aggregate.

The AC plant portion of the project will also increase the number of trips and vehicle miles traveled from the project site, but would decrease the VMT countywide from all supplying AC plants. The annual trips made countywide by all supplying quarries is expected to remain constant at approximately 11,720 trips per year, with Harris Quarry accounting for 5,622 trips. As with the aggregate production, the model produced a slight difference in the total number of trips projected under the two scenarios, but they were considered to be equal for analysis purposes. Countywide a total of 801,200 VMT are expected under Base Permit conditions; thisi would decrease to 648,100 VMT under project conditions which is a decease of approximately 153,000 VMT per year. It is expected that Harris Quarry would account for about 85,600 of the annual VMT associated with AC production. As noted for the quarry operation, an AC plant at the Harris Quarry site will increase the number of trips to and from the site but will reduce the total number of VMT in the County overall as the trip lengths are typically shorter than those made by out-of-County sources. The project has the potential to decrease the total VMT associated with hauling aggregate and AC within Mendocino County by approximately 183,500 VMT annually. These results are summarized in Table 8.

Table 8
Vehicle Miles Traveled Summary

Quarry Aggregate VMT	**Base Permit**		**Project**		**Change In VMT**
	Annual Trips	**Annual VMT**	**Annual Trips**	**Annual VMT**	
Harris	3,719	98,761	7,550	225,263	126,502
Davis Pit	3,721	322,636	3,579	318,899	-3,737
Keithly Ranch	4,959	415,506	4,747	401,631	-13,875
DNA River	1,240	145,695	1,209	144,970	-725
Cooks Humboldt	992	133,202	973	129,297	-3,905
Ford Gravel	9,920	287,671	8,096	236,262	-51,409
Ten Mile	2,480	75,480	2,018	58,816	-16,664
Pieta	2,481	109,033	2,058	89,771	-19,262
Layton Rock	2,480	69,650	2,088	47,997	-21,653
Cooks Valley	2,480	329,488	2,420	319,171	-10,317
Wisley Ranch	744	25,178	591	19,419	-5,759
Coal Mine	1,241	108,060	1,199	104,864	-3,196
Syar Healdsburg	2,449	326,041	2,412	319,551	-6,490
Total	***38,936***	***2,446,401***	***38,940***	***2,415,911***	***-30,490***
Plant AC VMT					
Harris	0	0	2,644	85,621	85,621
Granite	7,499	284,767	5,444	183,063	-101,704
Baxman	1,718	71,146	1,815	61,089	-10,057
Bodean/Syar (Santa Rosa)	2,501	445,239	1,816	318,347	-126,892
Total	***11,718***	***801,152***	***11,719***	***648,120***	***-153,032***
Project Total	**50,654**	**3,247,553**	**50,659**	**3,064,031**	**-183,522**

Note: VMT = Vehicle miles traveled

It is anticipated that VMT related to aggregate demand will increase in the future as population and demand for aggregate increases in Mendocino County. The relationships developed based

upon 2000 population data will remain valid in the future. As the demand for aggregate and AC increases, while production levels within the Mendocino County remain constant, the shortfall will be filled by out-of-County sources. Trips made from out-of-County sources have greater travel distances and result in higher VMT overall. Conversely, the expansion of the Harris Quarry together with AC production will result in fewer VMT in the future as a greater portion of the total demand will be met by quarries and AC plants within Mendocino County and less by out-of-County sources.

The increased aggregate production and a new AC plant associated with the Harris Quarry project will reduce the need to import aggregates and AC into the County as more of the demand will be met by local sources. However, the Harris Quarry project is not expected to eliminate the need to import aggregate and AC to meet current and future demand, and importation of aggregate and AC will remain a significant component in fulfilling the need for these products in Mendocino County.

Trip Distribution

The projected distribution of trips to and from the Harris Quarry under current aggregate production levels was tested and compared to driveway turning movements obtained in the summer of 2006. The VMT gravity model described earlier projects a trip distribution of 45 percent to/from the north and 55 percent to/from the south on US 101, which is consistent with measured driveway volumes.

The increased production potential of the Harris Quarry will cause the redistribution of trips from all quarries and will result in a different distribution of trips to and from the Harris Quarry along US 101. With the project and associated increase in production the distribution of trips is projected to shift to 35 percent of trips to/from the north and 65 percent to/from the south. Trips destined for the concrete plant in Willits were all assumed to be traveling to/from the north. Additionally, since employment does not necessarily match the gravity model, it was assumed that an equal number of employees will be coming from and return to the north and south.

If Harris Quarry is selected to provide aggregate and/or AC for the Willits Bypass construction, it is expected that a greater portion of quarry generated traffic will be destined to the north. For this condition it is estimated that 75 percent of trips will be to/from the north with the remaining 25 percent going to/from the south for base permit conditions and 60 percent to/from the north and 40 percent to/from the south for project conditions. These trip distribution assumptions are summarized in Table 9.

Table 9
Trip Distribution

Condition	Percent North	Percent South
Base	45	55
Base w/By-pass Construction	75	25
Project	35	65
Project w/ By-pass Construction	60	40
Aggregate to Concrete Plant in Willits	100	0

Study Scenarios

For consistency with the DEIR, the following weekday peak traffic hours were evaluated.

- 9:00 – 10:00 a.m.
- 11:00 a.m. – 12:00 Noon
- 1:15 – 2:15 p.m.
- 4:45 – 5:45 p.m.

To evaluate the highest impact situations, traffic generated by the Quarry was evaluated for July, when traffic on US 101 is at its highest, and October, when Quarry production peaks.

Conditions were evaluated for the following ten scenarios.

2010 Base Permit: This scenario is an analysis of operating conditions under projected 2010 traffic volumes together with operation of the Harris Quarry at current permitted levels.

2010 Project: Conditions with the Harris Quarry project added to projected 2010 traffic volumes are evaluated in this scenario.

2014 Base Permit with Willits Bypass Construction: This scenario indicates operating conditions under projected 2014 traffic volumes together with the operation of the Harris Quarry at current permitted levels, assuming that Harris Quarry is selected to supply material for the Willits Bypass project.

2014 Project with Willits Bypass Construction: Operating conditions under projected 2014 traffic volumes together with the Harris Quarry project, assuming that Harris Quarry is selected to supply material for the Willits Bypass project, are indicated by this scenario.

2014 Base Permit without Willits Bypass Construction: This scenario indicates operating conditions under projected 2014 traffic volumes together with the operation of the Harris Quarry at current permitted levels, assuming that Harris Quarry is not selected to supply material for the Willits Bypass project.

2014 Project with Willits Bypass Construction: Operating conditions under projected 2014 traffic volumes together with the Harris Quarry project assuming that Harris Quarry is not selected to supply material for the Willits Bypass project are indicated by this scenario.

2030 Base Permit: This scenario is an evaluation of operating conditions under projected 2030 traffic volumes with operation of the Harris Quarry at current permitted levels.

2030 Project: This scenario reflects operating conditions under projected 2030 traffic volumes together with the Harris Quarry project.

2040 Base Permit: This scenario is an evaluation of operating conditions under projected 2040 traffic volumes with operation of the Harris Quarry at current permitted levels.

2040 Project: The final scenario is an evaluation of operating conditions under projected 2040 traffic volumes together with the proposed Harris Quarry project.

Passenger Car Equivalent

Level of service calculations are based upon predominantly passenger vehicles, while the Quarry trip generation is primarily large trucks. Truck trips were factored to a passenger car equivalent (PCE) at a ratio of one truck being equivalent to four passenger vehicles. The purpose of the PCE is to account for the fact that a truck is considerably larger, slower and less maneuverable than a standard passenger car. The passenger car equivalent volumes were used in the evaluation of potential project impacts. PCE ratios were applied only to trucks entering or exiting the Quarry and not to preexisting truck traffic on US 101 that does not interact with the Quarry.

Speed Change Lane Warrants

The need for turn acceleration and/or deceleration speed change lanes on US 101 was evaluated based on recommendations of Larson and Mannering for the Washington State Transportation Center (TRAC), as contained in their report, "Method for Prioritizing Intersection Improvements" (1997). The authors performed analysis and review of several differing methodologies and found that the 1991 "Modified Harmelink" model developed by Kikuchi and Chakroborty yielded the most reliable and appropriate recommendations. These calculations are based upon passenger vehicles, which make up the vast majority of vehicles on the roadway; for trucks turning at the project driveway the above-described passenger car equivalents were used. The need for speed change acceleration lanes was determined using the same warrant methodology.

Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

Intersection

The intersection of US 101/Black Bart Drive was evaluated using the two-way stop-controlled intersection capacity method from the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. Since it is not subject to the influence of intersection control, the through movements on the main street, US 101, are assumed to operate at free flow and a Level of Service A. The level of service for each minor turning movement is based on the estimated average delay. Average delay for the intersection overall is also determined. The ranges of delay associated with the various levels of service are indicated in Table 10.

Table 10
Two-Way Stop-Controlled Intersection Level of Service Criteria

LOS A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.
LOS B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.
LOS C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.
LOS D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.
LOS E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.
LOS F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.

Reference: *Highway Capacity Manual*, Transportation Research Board, 2000

Grade Separated Access

For evaluation of the conversion of the intersection of the Quarry Access with US 101 to a grade-separated interchange, the grade-separated ramp capacity method from the HCM was used. The level of service for each ramp merge and diverge area is based upon the through volume on the main line as well as the volume of traffic entering or exiting the main line. The capacity of the ramp is expressed as a density of passenger cars per mile per lane. The ranges of density associated with the various levels of service are indicated in Table 11.

Table 11
Ramp Level of Service Criteria

	Density (passenger cars/mile/lane)

LOS A	Æ 10
LOS B	> 10-20
LOS C	> 20-28
LOS D	> 28-35
LOS E	> 35
LOS F	Demand exceeds capacity
Reference: *Highway Capacity Manual*, Transportation Research Board, 2000	

Minimum Acceptable Standards

In the *Guide for the Preparation of Traffic Impact Studies*, Caltrans indicates that they endeavor to maintain operation at the transition from LOS C to LOS D; however, where operation is already below LOS C, the existing measure of effectiveness should be maintained. For intersections, this means that the existing control delay should be maintained. Under this criteria, any increase in delay would therefore result in a significant impact. Since this approach results in impacts that are deemed significant for even a small change in operating conditions, staff at Caltrans was consulted. The issue of applying this standard was discussed with Mr. Marc Birnbaum, the Statewide Advisor for Local Development and Traffic Impact Studies. Mr. Birnbaum indicated that for intersections, the standard is to be applied to the overall average intersection delay, not that associated with any single movement or approach. These criteria do not apply for private road intersections, such as the entrance to the Harris Quarry, but were applied to the intersection of US 101/Black Bart Drive.

In its *General Plan*, Mendocino County establishes Policy DE-121 that states that, "New discretionary development will be required to demonstrate that basic infrastructure is available and has adequate capacity to serve the project without degrading existing level of service standards." The General Plan does not, however, establish thresholds for what level of degradation is considered to constitute a significant impact. For this reason, the above described Caltrans level of significance was applied to the study intersection. To provide a conservative analysis, in addition to the Caltrans standard for overall intersection operation, LOS D was considered to be the worst acceptable LOS for any single movement. This is consistent with standards established by many other jurisdictions throughout California. As with Caltrans standards, there are no applicable standards for private road intersections such as the Harris Quarry access road connection to US 101.

While Caltrans standards apply to the study intersection of US 101/Black Bart Drive, both the overall average intersection delay and the delay on the worst approach were considered to provide a conservative analysis. Additionally, the approach with the highest delay was used as a metric to determine the effectiveness of proposed turn-lane mitigating measures.

Base Permit Operations

Since renewal of the Quarry's permit to continue current operations is one of the options possible under this environmental review, the need for improvements under Base Permit conditions was evaluated. The evaluation takes into account the traffic volumes on the major roadway, US 101, as well as turning movements into and out of the minor street or access roadway and the speed of travel on the major roadway.

Speed Change Lanes

The need for speed change lanes was evaluated based on projected traffic volumes on both US 101 and the project access for peak day conditions. A northbound left turn lane and southbound right turn taper are warranted for all analysis years, with the exception of 2014 with the Willits Bypass construction; for this scenario the northbound left turn lane is not warranted. This exception is due to the fact that the Willits Bypass construction is expected to reduce

quarry traffic to the north to the point that not enough vehicles will make the northbound left turn movement to warrant the lane; however, since the lane is warranted without the bypass construction and is warranted in 2010, the installation of the northbound left turn lane is recommended for continued operation at currently permitted levels.

A southbound right turn lane is not warranted under any project scenario; however, since a right turn taper is warranted, and due to the proximity to Black Bart Drive, it is recommended that a full right-turn deceleration lane be installed. This will also operate as an acceleration lane for vehicles turning right out of Black Bart Drive.
A northbound left-turn acceleration lane is warranted immediately for continued Quarry operation. This lane would provide refuge for vehicles turning left out of the Quarry Access driveway onto Northbound US 101. This acceleration lane would provide space for turning vehicles to reach or at least approach free-flow speeds on US 101, therefore reducing the impact on through traffic and increasing the frequency of acceptable gaps for turning. This acceleration lane should be at least 1,410 feet in length, which would extend beyond Black Bart Drive and have a secondary benefit of providing refuge for vehicles turning out of Black Bart Drive. Since this lane would overlap with the northbound left-turn lane at Black Bart Drive, there is a possibility of a vehicle needing to use the lane to decelerate while another driver needs to use the lane to accelerate; however, it was determined that this is likely to be a rare occurrence. Therefore, no additional action is recommended.

Additionally, a southbound right-turn acceleration taper is warranted by 2030. This taper would give trucks an opportunity to accelerate before entering traffic.

Turn lane warrant results are summarized in Table 12 for each year; if a turn lane is warranted for one or more analysis time periods, it is considered to be warranted for that analysis year. Turn lane warrants were calculated for all analysis time periods for both July and October peak months and details are provided in Appendix G.

Table 12
Speed Change Lane Warrants for Base Permit Conditions

Year	Northbound Left Turn		Southbound Right Turn	
	Deceleration Lane	Acceleration Lane	Deceleration Taper	Acceleration Taper
2010	Warranted	Warranted	Warranted	Not Warranted
2014 w/o Willits Bypass	Warranted	Warranted	Warranted	Not Warranted
2014 w/Willits Bypass	Not Warranted	Warranted	Warranted	Not Warranted
2030	Warranted	Warranted	Warranted	Warranted
2040	Warranted	Warranted	Warranted	Warranted

Base Permit Intersection Level of Service

The Base Permit Conditions scenario indicates operation under projected traffic volumes at US 101/Black Bart Drive for the four study time periods during the July and October peak periods.

Under Base Permit conditions, the intersection of US 101/Black Bart Drive is expected to operate acceptably during all peak hours. The level of service results representing the movement with the highest delay for the July and October peak production periods are summarized in Table 12 for US 101/Harris Quarry Access and Table 13 for US 101/Black Bart Drive. Although not reported in Tables 13 and 14, the overall delay at both intersections was studied and was determined to be LOS A at all times with no more than 3.2 seconds of average delay. Detailed LOS calculations for average and peak production levels are provided in Appendix H.

Table 13
US 101/Harris Quarry Access Base Permit Level of Service Calculations – Peak Production

Condition	Production Period	9-10 AM		11 AM-noon		1:15-2:15 PM		4:45-5:45 PM	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
2010 Base Permit	July	15.6	C	21.7	C	23.5	C	20.7	C
Mitigated (turn lanes)	*July*	*13.0*	*B*	*15.3*	*C*	*15.7*	*C*	*14.7*	*B*
	October	13.9	B	17.6	C	17.2	C	15.5	C
Mitigated (turn lanes)	*October*	*12.2*	*B*	*13.8*	*B*	*13.5*	*B*	*12.7*	*B*
2014 Base Permit	July	16.6	C	24.11	C	26.5	D	23.0	C
Mitigated (turn lanes)	*July*	*13.5*	*B*	*16.1*	*C*	*16.6*	*C*	*15.4*	*C*
	October	14.5	B	19.0	C	19.0	C	18.6	C
Mitigated (turn lanes)	*October*	*12.5*	*B*	*14.4*	*B*	*14.0*	*B*	*13.2*	*B*
2014 Base Permit w/Bypass	July	19.4	C	30.5	D	31.6	D	23.0	C
Mitigated (turn lanes)	*July*	*14.9*	*B*	*18.3*	*C*	*18.3*	*C*	*15.4*	*C*
	October	15.4	C	20.9	C	22.4	C	16.6	C
Mitigated (turn lanes)	*October*	*13.1*	*B*	*15.2*	*C*	*15.7*	*C*	*13.2*	*B*
2030 Base Permit	July	22.0	C	**39.6**	**E**	**45.4**	**E**	**36.8**	**E**
Mitigated (turn lanes)	*July*	*15.6*	*C*	*19.9*	*C*	*20.7*	*C*	*18.8*	*C*
	October	17.7	C	26.7	D	26.2	D	22.3	C
Mitigated (turn lanes)	*October*	*14.0*	*B*	*17.0*	*C*	*16.5*	*C*	*15.2*	*C*
2040 Base Permit	July	26.9	D	**57.7**	**F**	**67.9**	**F**	**51.7**	**F**
Mitigated (turn lanes)	*July*	*17.2*	*C*	*23.1*	*C*	*24.1*	*C*	*21.5*	*C*
	October	20.4	C	34.3	D	33.7	D	27.6	D
Mitigated (turn lanes)	*October*	*15.1*	*C*	*19.0*	*C*	*18.3*	*C*	*16.7*	*C*

Notes: Delay is in average number of seconds per vehicle; LOS = Level of Service; **Bold** = deficient operation

Table 14
US 101/Black Bart Drive Base Permit Level of Service Calculations – Peak Production

Condition	Production Period	9-10 AM		11 AM-noon		1:15-2:15 PM		4:45-5:45 PM	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
2010 Base Permit	July	15.8	C	25.5	D	20.0	C	19.9	C
Mitigated (turn lanes)	*July*	*13.1*	*B*	*17.0*	*C*	*14.4*	*B*	*14.3*	*B*
	October	13.3	B	18.9	C	20.4	C	15.0	B
Mitigated (turn lanes)	*October*	*11.9*	*B*	*14.4*	*B*	*14.8*	*B*	*12.5*	*B*
2014 Base Permit	July	16.8	C	31.2	D	22.6	C	22.5	C
Mitigated (turn lanes)	*July*	*13.6*	*B*	*18.3*	*C*	*15.3*	*C*	*15.1*	*C*
	October	13.9	B	20.9	C	22.8	C	16.2	C
Mitigated (turn lanes)	*October*	*12.2*	*B*	*15.2*	*C*	*15.7*	*C*	*13.0*	*B*
2014 Base Permit w/Bypass	July	17.0	C	31.8	D	22.7	C	22.5	C
Mitigated (turn lanes)	*July*	*13.7*	*B*	*18.4*	*C*	*15.3*	*C*	*15.11*	*C*
	October	14.0	B	21.2	C	23.2	C	16.2	C
Mitigated (turn lanes)	*October*	*12.3*	*B*	*15.3*	*C*	*13.0*	*B*	*13.6*	*B*
2030 Base Permit	July	23.1	C	**68.6**	**F**	**40.9**	**E**	**40.4**	**E**
Mitigated (turn lanes)	*July*	*16.0*	*C*	*24.6*	*C*	*19.3*	*C*	*19.0*	*C*
	October	17.0	C	32.7	D	38.3	E	22.6	C
Mitigated (turn lanes)	*October*	*13.7*	*B*	*18.6*	*C*	*19.5*	*C*	*15.1*	*C*
2040 Base Permit	July	29.8	D	**	**F**	**69.2**	**F**	**68.6**	**F**
Mitigated (turn lanes)	*July*	*18.0*	*C*	*30.6*	*D*	*22.8*	*C*	*22.4*	*C*

	October	19.9	C	**47.5**	**E**	**59.9**	**F**	29.6	D
Mitigated (turn lanes)	*October*	*14.9*	*B*	*21.5*	*C*	*22.9*	*C*	*16.9*	*C*
Notes: Delay is in average number of seconds per vehicle; LOS = Level of Service; **Bold** = deficient operation ** = greater than 120 seconds of average delay									

Base Permit Conditions

Analysis Years

Project impacts were analyzed for the horizon years of 2010, 2014, 2030 and 2040. Year 2014 conditions were evaluated both with and without the Willits bypass under construction. While this construction would alter distribution of project trips, it would not be expected to change background traffic volumes on US 101 in the vicinity of Black Bart Drive and the Harris Quarry.

Base Permit Intersection Operation

Intersection Level of Service was determined for both US 101/Black Bart Drive and US 101/Quarry Access Driveway based upon the existing lane configuration. The intersection of US 101/Harris Quarry Access is provided for informational purposes. Since LOS criteria do not apply to private driveways, only the intersection of US 101/Black Bart Drive is discussed in further detail.

Year 2010

The intersection of US 101/Black Bart Drive is expected to operate at LOS A overall and the stop-controlled eastbound approach is expected to operate at LOS D or better during all time periods.

Year 2014 (No Willits Bypass)

Under the projected 2014 Base Permit conditions the intersection of US 101/Black Bart Drive is expected to operate acceptably at LOS A overall with the eastbound approach operating at LOS D or better during all time periods analyzed.

Year 2014 (During Willits Bypass Construction)

With the change in distribution that would be expected if Harris Quarry is selected to provide material for the construction of the Willits Bypass, US 101/ Black Bart Drive is expected to operate at LOS A overall with all individual movements operating at LOS D or better during all peak hours analyzed.

Year 2030

Under the projected year 2030 volumes with production at permitted levels, US 101/Black Bart Drive is expected to operate overall acceptably at LOS A; however as indicated in Table 9, the eastbound approach is expected to operate deficiently at LOS E during the 11:00-noon time period and LOS F during the 1:15-2:15 p.m. and 4:45-5:45 p.m. time periods in July, though acceptable operating conditions of LOS D or better are projected for the 9:00-10:00 a.m. peak hour during July and during all four time periods analyzed in October.

Year 2040

As shown in Table 9, under the projected year 2040 volumes and with production at levels consistent with the existing permit, the eastbound movement at US 101/Black Bart Drive is expected to operate deficiently at LOS F during the11:00-noon, 1:00-2:00 p.m. and 4:45-5:45 p.m. time periods in July as well as LOS E in 11:00-noon and LOS F in 1:15-2:15 p.m. time

periods in October. For the 9:00-10:00 a.m. time period in July and for the 9:00-10:00 a.m. and 4:45-5:45 p.m. time periods in October, the eastbound movement is projected to operate acceptably at LOS D or better. Overall, the intersection is expected to operate acceptably at LOS A during all time periods.

Base Permit Mitigated Intersection Operations

Year 2010

Based upon intersection LOS, no mitigating measures are necessary; however, with the installation of the speed change and turn lanes that are currently warranted, the LOS does slightly improve.

Year 2014 (Without Willits Bypass Construction)

Based upon intersection LOS, no mitigating measures are necessary; however, with the installation of all warranted speed change and turn lanes, the LOS does slightly improve.

Year 2014 (With Willits Bypass Construction)

Based upon intersection LOS, no mitigating measures are necessary. As with other scenarios, the installation of all warranted speed change and turn lanes improves the LOS slightly.

Year 2030

With the existing lane configuration, the intersection of US 101/Black Bart Drive would be expected to operate deficiently in 2030; however, with the addition of the above discussed speed change and turn lanes, all movements at US 101/Black Bart Drive are expected to operate acceptably at LOS D or better during all time periods.

Year 2040

Without any improvements the intersection of US 101/Black Bart Drive is expected would continue to operate deficiently in 2040. However, acceptable operation of LOS D or better would be expected during all time periods with the addition of the above discussed improvements.

Driveway Operation

Although there are no LOS standards for a private driveway, if there is excessive delay for drivers turning to or from the driveway they may be willing to turn in an adequate gap in traffic, therefore creating a potential safety issue. For this reason, operation of the Quarry Access Driveway was studied and it was determined that with the installation of all recommended turn lanes, the driveway would operate acceptably at all times with, on average, no more than 24.1 seconds of delay for exiting traffic. This greatly reduces the possibility of drivers attempting to make turns without an adequate gap in traffic.

Project Conditions

Speed Change Lanes

As with the Base Permit conditions, the need for speed change lanes was evaluated based on projected traffic volumes on both US 101 and the project turning movements for peak day conditions. The northbound left turn lane and southbound right turn taper are warranted for all analysis years. Although a southbound right-turn lane is not warranted, it is recommended that one be installed due to the driveway's proximity to Black Bart Drive. Additionally a northbound

left-turn acceleration lane is warranted that would provide refuge for vehicles turning left out of the Quarry Access driveway onto Northbound US 101. As with the Base Permit condition, this acceleration lane should be at least 1,410 feet in length, which would extend beyond Black Bart Drive and have a secondary benefit of providing refuge for vehicles turning out of Black Bart Drive. A southbound right-turn acceleration taper is already warranted and a full acceleration lane is warranted by 2040. Turn lane warrant results are summarized in Table 15 for each year; if a turn lane is warranted for one or more analysis time periods, it is considered to be warranted for that analysis year. Turn lane warrants were calculated for all analysis time periods for both July and October peak months and details are provided in Appendix G.

Table 15
Speed Change Lane Warrants for Project Conditions

Year	Northbound Left Turn		Southbound Right Turn	
	Deceleration Lane	Acceleration Lane	Deceleration Taper	Acceleration Taper
2010	Warranted	Warranted	Warranted	Warranted
2014 w/o Willits Bypass	Warranted	Warranted	Warranted	Warranted
2014 w/Willits Bypass	Warranted	Warranted	Warranted	Warranted
2030	Warranted	Warranted	Warranted	Warranted
2040	Warranted	Warranted	Warranted	Warranted (full acceleration lane)

Project Intersection Level of Service

The Project Conditions scenario indicates operation under projected traffic volumes at US 101/Black Bart Drive for the four study time periods during the July and October peak periods. Tables 16 and 17 summarize Levels of Service for US Harris Quarry Access and US 101/Black Bart Drive, respectively. Although not reported in Tables 16 and 17, the overall average delay at both intersections was studied and determined to be in the LOS A range at all times at 3.3 seconds or less. Detailed LOS calculations for average and peak production levels are provided in Appendix H.

Table 16
US 101/Harris Quarry Access Project Level of Service Calculations – Peak Production

Condition	Production Period	9-10 AM		11 AM-noon		1:15-2:15 PM		4:45-5:45 PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2010 Project	July	16.8	C	24.5	C	26.2	C	21.0	C
Mitigated (turn lanes)	*July*	*13.6*	*B*	*16.1*	*C*	*16.4*	*C*	*14.8*	*B*
	October	15.0	C	19.7	C	18.6	C	15.7	C
Mitigated (turn lanes)	*October*	*12.8*	*B*	*14.7*	*B*	*14.1*	*B*	*12.8*	*B*
2014 Project	July	18.0	C	28.0	D	30.3	D	23.4	C
Mitigated (turn lanes)	*July*	*14.1*	*B*	*17.0*	*C*	*17.4*	*C*	*15.5*	*C*
	October	15.8	C	21.6	C	20.3	C	16.8	C
Mitigated (turn lanes)	*October*	*13.2*	*B*	*15.3*	*B*	*14.7*	*B*	*13.2*	*B*
2014 Project w/Bypass	July	21.1	C	**36.9**	**E**	**39.3**	**E**	23.4	C
Mitigated (turn lanes)	*July*	*15.4*	*C*	*19.4*	*C*	*19.6*	*C*	*15.5*	*C*
	October	17.7	C	26.0	D	24.8	C	16.8	C
Mitigated (turn lanes)	*October*	*14.2*	*B*	*16.9*	*C*	*16.3*	*C*	*13.2*	*B*
2030 Project	July	25.0	D	**55.4**	**F**	**63.0**	**F**	**38.0**	**E**
Mitigated (turn lanes)	*July*	*16.5*	*C*	*21.7*	*C*	*22.3*	*C*	*19.1*	*C*
	October	20.0	C	33.8	D	30.9	D	22.7	C

Mitigated (turn lanes)	*October*	*14.9*	*B*	*18.4*	*C*	*17.5*	*C*	*15.3*	*C*
2040 Project	July	32.3	D	**100.6**	**F**	**118.0**	**F**	**54.2**	**F**
Mitigated (turn lanes)	*July*	*18.4*	*C*	*25.8*	*D*	*26.5*	*D*	*21.8*	*C*
	October	23.8	C	**49.1**	**E**	**43.5**	**E**	28.2	D
Mitigated (turn lanes)	*October*	*16.2*	*C*	*20.9*	*C*	*19.7*	*C*	*16.9*	*C*

Notes: Delay is in average number of seconds per vehicle; LOS = Level of Service; **Bold** = deficient operation

Table 17
US 101/Black Bart Drive Project Level of Service Calculations – Peak Production

Condition	**Production Period**	**9-10 AM**		**11 AM-noon**		**1:15-2:15 PM**		**4:45-5:45 PM**	
		Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
2010 Project	July	16.2	C	27.6	D	20.5	C	19.7	C
Mitigated (turn lanes)	*July*	*13.3*	*B*	*17.3*	*C*	*14.6*	*B*	*14.3*	*B*
	October	13.7	B	19.6	C	21.0	C	15.0	B
Mitigated (turn lanes)	*October*	*12.1*	*B*	*14.7*	*B*	*15.1*	*C*	*12.5*	*B*
2014 Project	July	17.2	C	32.4	D	23.2	C	21.8	C
Mitigated (turn lanes)	*July*	*13.9*	*B*	*18.6*	*C*	*15.4*	*C*	*15.1*	*C*
	October	14.2	B	21.7	C	20.6	C	16.2	C
Mitigated (turn lanes)	*October*	*12.4*	*B*	*15.4*	*C*	*15.9*	*C*	*13.0*	*B*
2014 Project w/Bypass	July	17.7	C	33.6	D	23.7	C	22.5	C
Mitigated (turn lanes)	*July*	*14.0*	*B*	*18.9*	*C*	*15.6*	*C*	*15.1*	*14.0*
	October	14.6	B	22.5	C	24.3	C	16.2	C
Mitigated (turn lanes)	*October*	*12.6*	*B*	*15.7*	*C*	*16.2*	*C*	*13.0*	*B*
2030 Project	July	23.8	C	**72.6**	**F**	**42.9**	**E**	**40.5**	**E**
Mitigated (turn lanes)	*July*	*16.3*	*C*	*25.1*	*D*	*19.6*	*C*	*19.6*	*C*
	October	17.6	C	34.4	D	40.0	E	22.6	C
Mitigated (turn lanes)	*October*	*13.9*	*B*	*19.0*	*C*	*19.9*	*C*	*15.2*	*C*
2040 Project	July	30.9	D	**	**F**	**73.0**	**F**	**68.7**	**F**
Mitigated (turn lanes)	*July*	*18.3*	*C*	*31.4*	*D*	*23.2*	*C*	*22.4*	*C*
	October	20.6	C	**50.6**	**E**	**63.4**	**F**	29.6	D
Mitigated (turn lanes)	*October*	*15.1*	*C*	*22.1*	*C*	*23.3*	*C*	*16.9*	*C*

Notes: Delay is in average number of seconds per vehicle;, LOS = Level of Service; **Bold** = deficient operation
** = greater than 120 seconds of average delay

Project Conditions

Turning movements at the Quarry were calculated using the project trip generation values and trips to and from the north added as through movements at Black Bart Drive. These volumes were used to evaluate need for turn lanes as well as intersection operation. Results for the driveway are provided for informational purposes as LOS criteria do not apply to private driveways. Only the intersection of US 101/ Black Bart Drive is therefore discussed in further detail.

Project Intersection Operation

Year 2010

With the addition of project generated traffic and no changes to the existing configuration, the intersection of US 101/Black Bart Drive is expected to operate overall acceptably at LOS A with the eastbound approach operating acceptably at LOS D or better during all time periods studied.

Year 2014 (No Willits Bypass)

As shown in Table 9, with project-generated traffic added to 2014 volumes acceptable operation of LOS C or better on all individual US 101/Black Bart Drive approaches and LOS A overall operation is expected.

Year 2014 (During Willits Bypass Construction)

Conditions with the Bypass construction are nearly identical to those without it. US 101/Black Bart Drive would operate acceptably during all periods evaluated.

Year 2030

In the year 2030 the intersection of US 101/Black Bart Drive is expected to operate overall at LOS A; however, the eastbound left turn movement would be expected to operate unacceptably at LOS E or F during the 11 a.m.-12 noon, 1:15 to 2:15 p.m. and 4:45 to 5:45 p.m. time periods in July under the existing configuration.

Year 2040

Under projected 2040 volumes, US 101/Black Bart Drive is expected to operate at LOS A overall; however, the eastbound left turn movement is expected to operate unacceptably at LOS E or F during the 11 a.m.-12 noon, 1:15 to 2:15 p.m. and 4:45 to 5:45 p.m. time periods in July and the 11 a.m.-12 noon and 1:15 to 2:15 p.m. time periods in October.

Project Mitigated Conditions

Year 2010

Based upon intersection LOS, no mitigating measures are necessary; however, with the installation of all warranted speed change and turn lanes, the LOS does improve slightly.

Year 2014 (Without Willits Bypass Construction)

No mitigating measures are necessary to address operation; however, installation of speed change and turn lanes would be expected to reduce delay slightly.

Year 2014 (During Willits Bypass Construction)

Again, no mitigation is warranted based upon intersection LOS, but operation would improve slightly with installation of turn and speed change lanes.

Year 2030

With the addition of the previously described improvements, all movements at US 101/Black Bart Drive would be expected to operate acceptably during all time periods.

Year 2040

Continued acceptable operation is expected at US 101/Black Bart Drive in 2040 with the improvements noted above.

Driveway Operation

As with the Base Permit conditions, operation of the quarry driveway was studied to determine average delays experienced by drivers exiting the site. With the installation of all recommended

speed change and turn lanes, the driveway would operate acceptably at all times with and average delay of 23.3 seconds or less for exiting traffic.

Turn Lane Lengths

The minimum length of the left-turn lane has previously been determined by the California Department of Transportation (Caltrans) as communicated in a letter dated September 18, 2006, from Mr. Jesse Robertson. Based upon application of standards in the *Highway Design Manual*, 6th Edition, Caltrans staff have indicated that it is acceptable to assume that turning vehicles will slow to 43.5 mph in the through lane with the remaining deceleration occurring in the turn lane, resulting in a deceleration length of 371 feet. Additionally, Caltrans is requiring vehicle storage of 98 feet for a total turn lane length of 469 feet. A copy of this letter is provided in Appendix I.

The lengths of the left-turn and right-turn acceleration lanes were determined using Exhibit 10-70 from American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on the Geometric Design of Highways and Streets*. The length needed to achieve a merging speed of 50 mph on a highway with a 65-mph design speed is 1,410 feet. To assess the impacts on the acceleration length of trucks the National Cooperative Highway Research Program (NCHRP) Report 505, *Review of Truck Characteristics in Roadway Design*, was consulted. Since the northbound acceleration lane would be below two-percent grade over the length of the acceleration lane, the acceleration distance of 1,410 feet remains appropriate for truck acceleration. However, since the southbound acceleration lane is at a two-percent down grade, Tables 64 and 65, "Maximum Weight-to-Power Ratios for Minimum Acceleration Length," in the NCHRP publication were consulted. For the down-grade, the weight-to-power ratio is decreased from 110 pounds per horsepower at a zero percent grade to 85 pounds per horsepower at two-percent grade. Applying this ration of 85 to 110, the length of the southbound acceleration lane is decreased from 1,410 feet to 1,090 feet A standard 300-foot transition taper will be needed at the terminus of the acceleration lane. The turn lane lengths are summarized in Table 18.

Table 18
Turn and Acceleration Lane Lengths (feet)

	Northbound Left-Turn Lane	**Northbound Acceleration Lane**	**Southbound Acceleration Lane**
Taper	120	300	300
Storage	98	N/A	N/A
Deceleration/Acceleration	251	1,410	1,090
Total	**469**	**1,710**	**1,390**

While a southbound right turn lane is not warranted, due to the proximity to Black Bart Drive and since a right turn deceleration taper is warranted, it is recommended that a short right turn lane of approximately 200 feet be installed for the Harris Quarry Entrance. The length of this turn lane is supported by Caltrans staff as communicated in a letter dated August 8, 2006, from Mr. Jesse Robertson; a copy of this letter is provided in Appendix I. To avoid potential conflicts with other movements, the southbound right turn lane for the Quarry Entrance should not extend the entire distance to Black Bart Drive so that southbound through movements destined for the Quarry do not enter the right-turn lane north of Black Bart Drive, causing confusion for drivers exiting Black Bart Drive.

Circulation Improvements

The following circulation improvements are recommended for both Base Permit and Project conditions:

Left Turns into Project Driveway From Northbound US 101

A left turn deceleration lane is needed on the northbound US 101 approach to the Quarry entrance. This would significantly reduce safety concerns associated with trucks slowing and turning left into the Quarry from the high speed left lane on the expressway, and would be a significant benefit.

Right Turns into Project Driveway from Southbound US 101

A right turn deceleration lane is needed on the Southbound US 101 approach to the Quarry entrance. This would allow vehicles turning right into the Quarry to slow outside of the through travel lane where speeds are often in excess of 60 miles per hour. Due to its proximity to the Quarry entrance, this right turn lane could also be used as a right turn acceleration lane by vehicles exiting Black Bart Drive. This would be a significant benefit.

Right Turns from Project Driveway to Southbound US 101

A southbound right turn acceleration taper was determined to be warranted for all but the 2040 conditions to allow loaded trucks leaving the quarry to enter the highway. Under the 2040 conditions an acceleration lane will be needed to allow trucks turning right from the quarry to get fully or partially up to prevailing travel speeds on US 101 before merging.

Left Turns from Project Driveway to Northbound US 101

A left turn acceleration lane is recommended for northbound US 101 north of the Quarry entrance. This lane would significantly improve safety for trucks turning left onto US 101 from the Quarry as they would no longer need to gain speed in the left travel lane of the expressway. This would be a significant benefit.

Alternative Quarry Access

As an alternative to the current quarry access driveway, installation of a partial grade-separated interchange was studied. This partial grade-separation would affect movements to and from northbound US 101 and eliminate the need for trucks to cross oncoming traffic while making left-turns into or out of the site. These movements would instead occur via on- and off-ramps on the east side of the existing expressway. Since drivers making the inbound and outbound right-turns do not have to cross oncoming traffic, these movements would still occur at an at-grade driveway. All right turn lanes and tapers warranted for the Base Permit or Project conditions would still be warranted with the partial grade-separated driveway.

Analysis of operating conditions for both ramps for all study time periods indicates that a grade separated access would be expected to operate acceptably at LOS B or better. Although a partial grade-separated driveway would operate at a better level of service than an at-grade driveway, this improvement is neither warranted nor recommended because acceptable operation can be achieved at the existing at-grade driveway through installation of turn and speed change lanes. Further, there is no documented historical safety issue based upon collision data that would indicate the need for grade separation. Detailed LOS calculations are provided in Appendix J.

Alternative Modes of Transportation

In addition to transportation by personal vehicle, transportation by pedestrians, bicyclists and transit users was considered. Since the majority of trips associated with Harris Quarry are truck haul trips, alternative modes of transportation are not feasible; however, alternative transportation was considered for employees or other Quarry users.

Pedestrian

Currently, no designated pedestrian facilities are provided on US 101 in the vicinity of the project site nor are there pedestrian facilities provided on Black Bart Drive. This is consistent with the rural and low density nature of surrounding land uses and the lack of pedestrian-oriented destinations. The proposed project is not expected to generate a need for pedestrian facilities and no additional facilities are recommended.

Bicycle

While no separated bicycle facilities are currently provided on US 101, bicyclists my utilize the existing shoulder. No separated bicycle facilities are provided along Black Bart Drive. As with pedestrian uses, this is consistent with the rural nature of the surrounding land uses. The proposed project is not expected to generate a need for bicycle facilities, so no additional facilities are recommended; however, when widening of US 101 is completed to add recommended turn lanes, shoulders should be built to applicable Caltrans standards so that they may continue to be utilized by bicyclists.

Transit

Mendocino Transit Authority (MTA) provides service to destinations within Mendocino County as well as some connections to adjacent counties. While MTA does operate fixed-route bus service along the US 101 corridor, there are no scheduled transit stops in the vicinity of the project. The proposed project is not expected to generate a need for additional transit services, so no modifications are recommended.

Driveway Safety

The effect of adverse weather conditions, especially fog, was considered as part of this analysis. While it is impossible to predict future safety conditions, historical data can indicate trends. As noted previously, during the five-year period reviewed there were no reported collisions at the project driveway and there were no collisions within one-half mile north or south of the project driveway involving large trucks with trailers. Since no historical safety issues are present, no mitigating measures are recommended.

Since the driveway is located along a high-speed expressway with highly dispersed intersections, advance warning signs should be placed on US 101 to the north and south of the project driveway. It is recommended “Slow Trucks,” California MUTCD sign designation W51(CA), be installed together with flashing beacons programmed to be on during normal quarry operating hours.

Impacts and Mitigation Measures

Base Permit Conditions

Year 2010

Impact T-1: Trucks traveling northbound and making a left turn into the Quarry must do so from the inside, or fast, lane on US 101, effectively blocking northbound through traffic in this lane while waiting for an acceptable gap in southbound traffic to make the left turn. This creates a safety and operations risk. This is considered a Class II Impact – significant, but mitigable.

Mitigation T-1: Install a 469-foot left turn lane for northbound traffic at the Quarry entrance.

Impact T-2: Trucks turning left out of the Quarry site must accelerate to reach highway speeds while climbing, resulting in trucks that are moving slower than the surrounding traffic. This creates a safety and operations risk. This is considered a Class II Impact – significant, but mitigable.

Mitigation T-2: Install a northbound acceleration lane. A length of 1,710 feet is needed for the acceleration lane to serve project volumes, which exceeds the available distance between the Harris Quarry access and Black Bart Drive. A special lane designation to permit left-turns onto Black Bart Drive and acceleration for both left-turns from Black Bart Drive and acceleration from the Harris Quarry access to northbound US 101will need to be developed. The extension of the left turn acceleration lane through the intersection at Black Bart Drive can then be used for acceleration by drivers turning left from Black Bart Drive. The overlap of the left turn acceleration lane for trucks leaving the Quarry with the left turn deceleration lane for vehicles entering Black Bart Drive creates a possibility of conflict between a truck accelerating behind a vehicle decelerating. Using the left turn warrant method it was determined that this conflict will not occur in over 97 percent of turning movements; therefore, no further consideration is necessary.

Impact T-3: Trucks making a right turn into the Quarry from southbound US 101 must slow down in the outside travel lane on US 101. This creates a safety and operations risk. This is considered a Class II Impact – significant, but mitigable.

Mitigation T-3: Install a short right turn lane of approximately 200 feet in length for southbound traffic at the Quarry entrance. This lane should not extend to Black Bart Drive to avoid having drivers destined for the Quarry entering the right-turn lane north of Black Bart Drive.

Year 2014 (without Willits Bypass)

See Mitigation Measures T-1, T-2 and T-3; no new mitigation measures would be warranted.

Year 2014 (with Willits Bypass)

See Mitigation Measures T-1, T-2 and T-3; no new mitigation measures would be warranted.

Year 2030

See Mitigation Measures T-1, T-2 and T-3 in addition to the following new mitigation measure.
Impact T-4: Trucks turning right to US 101 southbound when exiting the Quarry must enter the outside travel lane after waiting for an acceptable gap in southbound traffic. Under projected volumes, gaps in traffic may not always be sufficient to allow for full acceleration in the travel lane. This is considered a Class II Impact – significant, but mitigable.

Mitigation T-4: Install an acceleration taper for trucks making the right turn onto US 101 southbound at the Quarry entrance to allow for some acceleration prior to entering the travel lane.

Year 2040

See Mitigation Measures T-1, T-2, T-3 and T-4; no new mitigation measures would be warranted.

Project Conditions

Year 2010

Impacts T-1 through T-4 would be expected by horizon year 2010, resulting in the need for Mitigation Measures T-1, T-2, T-3 and T-4.

Year 2025

See Mitigation Measures T-1, T-2, T-3 and T-4; no new mitigation measures would be warranted.

Year 2040

See Mitigation Measures T-1, T-2, T-3 and T-4 in addition to the following new mitigation measure.

Impact T-5: Under projected 2040 traffic volumes the right-turn acceleration taper indicated as Mitigation Measure T-4 would no longer be adequate and a full acceleration lane would be warranted. This is considered a Class II Impact – significant, but mitigable.

Mitigation T-5: Install a 1,390-foot-long speed change acceleration lane for trucks turning right onto US 101 southbound at the Quarry entrance to allow for full acceleration prior to entering the travel lane.

Conclusions and Recommendations

Conclusions

- During peak operating conditions, the project is expected to generate 310 truck trips in July and 412 truck trips in October. This is an increase of 196 and 262 truck trips from current operating conditions for July and October, respectively.

- During average operating conditions the project is expected to generate 215 truck trips in July and 286 truck trips in October. This is an increase of 131 and 182 truck trips from current operating conditions for July and October, respectively.

- The project has the potential to reduce vehicle miles traveled (VMT) associated with hauling aggregate and AC within the County by approximately 183,500 VMT annually.

- Northbound left turn deceleration and acceleration lanes are warranted in 2010 under Base Permit and Project conditions.

- A southbound right turn deceleration taper in warranted in 2010 under Base Permit and Project conditions; however, due to the proximity to Black Bart Drive, installation of a full deceleration lane that extends to Black Bart Drive would be beneficial.

- A southbound right turn acceleration taper is warranted in 2030 for continued operation of the quarry at its currently permitted levels.

- A southbound right turn acceleration taper is warranted in 2010 for Project Conditions. By the year 2040, a full right turn acceleration lane is warranted.

- Without the implementation of proposed mitigating measures, the intersection of US 101 and Black Bart Drive is expected to operate unacceptably in 2030 and 2040 with or without expansion of Quarry operations.

- With the implementation of recommended mitigating measures, the intersection of US 101 and Black Bart Drive is expected to continue to operate acceptably through the horizon year of 2040.

- The proposed project is not expected to generate a need for additional pedestrian, bicycle or transit facilities.

- Under the Project scenario and with the implementation of all recommended mitigating measures, the intersection of US 101 and Black Bart Drive is expected to operate at the same or better levels of service than without the project and associated mitigating measures for all scenarios and during all study periods, resulting in less average delay. This appears to be consistent with the Mendocino County General Plan policy DE-121.

- A partial grade-separated driveway would eliminate left-turning movements across oncoming traffic and would operate acceptably during all study time periods. However, based upon projected operations of the at-grade intersection with the implementation of all recommended mitigating measures, a partial grade-separation is not warranted.

Recommendations

- Install a 469-foot long left-turn lane on US 101 North; this improvement is required regardless of whether the Quarry continues operation at the currently permitted levels or expands its operation.

- Install a 1,710-foot long acceleration lane on US 101 North; this improvement is required regardless of whether the Quarry continues operation at the currently permitted levels or expands its operation.

- Install a right turn lane of approximately 200 feet in length on US 101 South at the Harris Quarry Entrance; this improvement is required regardless of whether the Quarry continues operation at the currently permitted levels or expands its operation. This lane should be configured in a manner to prevent drivers destined for the Quarry from entering the lane north of Black Bart Drive as this may cause confusion for drivers on Black Bart Drive.

- Install a right turn acceleration taper on US 101 South; this is improvement is needed immediately for the project, but not until 2030 if operation continues at the currently permitted levels. This lane will need to be converted to a full acceleration lane 1,390 feet in length by 2040 to accommodate the Project.

- Since the Quarry Access Driveway is expected to operate acceptably during all study periods with the implementation of the recommended mitigating measures, and since there are no documented historical safety issues associated with trucks turning at the project driveway, the installation of the partial grade-separation is not recommended.

- Installation of “Slow Trucks” warning signs with flashing beacons is recommended for both the northbound and southbound approaches to the Quarry Access Driveway.

Study Participants and References

Study Participants

Principal-in-Charge:	Dalene J. Whitlock, PE, PTOE
Project Engineer:	Allan G. Tilton, PE
Assistant Engineer:	Tony Henderson, EIT
Graphics/Technician:	Deborah J. Mizell
Editing/Formatting:	Angela McCoy

References

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Communications

Letter regarding the required minimum length of the left-turn lane, Mr. Jesse Robertson of California Department of Transportation, August 8, 2006

Letter regarding the required minimum length of the left-turn lane, Mr. Jesse Robertson of California Department of Transportation, September 28, 2006

April 7, 2010

Mr. Pat Allen
Northern Aggregate, Inc.
P.O. Box 1566
Willits, CA 95490

Addendum to the *Updated Supplemental Traffic Impact Analysis for the Harris Quarry*

Dear Mr. Allen;

Whitlock & Weinberger Transportation (W-Trans) has recently completed the *Updated Supplemental Traffic Impact Analysis for the Harris Quarry* in the County of Mendocino. As part of the analysis, we completed an analysis of Vehicle Miles Traveled (VMT) associated with County-wide aggregate distribution based upon quarries that are likely to distribute within Mendocino County, which includes all quarries located in Mendocino County as well as quarries within neighboring parts of Sonoma County, Humboldt County and Lake County. This analysis was completed for existing conditions and projected conditions with the Harris Quarry expansion; however, it did not include the currently proposed Kunzler Quarry to be located north of Ukiah since it is still in the application process and has not yet been approved. We have been asked to provide an analysis with the Kunzler Quarry included in the VMT analysis.

A review of the Draft Environmental Impact Report for the Kunzler Quarry revealed that an analysis of that project's impact on VMT was not conducted. A new scenario, "Harris Quarry Project plus Near Term Cumulative" was developed in addition to the Base Permit and Project scenarios already analyzed using the same assumptions for the Kunzler Quarry as were applied to the Harris Quarry project.

The Kunzler Quarry site is located just north of the City of Ukiah, the largest population center in Mendocino County. In general quarries provide more aggregate to population centers that are closer to the quarry and correspondingly fewer trips to population centers of equal size that are further away. Likewise larger population sub-areas will have a greater demand potential than smaller sub-areas and will attract more trips.

For analysis purposes, it was necessary to hold demand equal over all scenarios to provide a common point of comparison. The number of trips and VMT from each quarry to each population center fulfilling the demand for aggregate within the County was calculated. Calculations are enclosed that should be considered part of Appendix F.

It is projected for Base Permit conditions that all supplying quarries will make a combined total of approximately 38,900 truck haul trips per year with a combined total of approximately 2.45 million miles traveled to provide aggregate within Mendocino County. With the increased production potential of the Harris Quarry to 200,000 cubic yards of material mined as well as including the Near Term Cumulative increase in production, assuming that the demand for aggregate remains constant, it is projected that the total of truck hauls made countywide by all supplying quarries will remain constant at approximately 38,900 truck haul trips per year. There is a slight difference in truck trips per year between the three scenarios which is attributed to rounding in the calculations and accounts for about one-hundredth of one percent of all trips, so for the purpose of analysis these values are considered to be equal.

The increased production of the Harris Quarry project will not reduce the number of haul trips but will result in approximately 2.42 million vehicle miles traveled annually from all quarries and will result in 30,490 fewer VMT by aggregate haul trucks. Approval of the Kunzler Quarry together with the increased production at the Harris Quarry will not reduce the number of haul trips but will result in approximately 1.51 million vehicle miles traveled annually from all quarries, which is about 931,000 fewer VMT by aggregate haul trucks.

Although the number of aggregate haul trips is equivalent, the total VMT decreases because the Harris Quarry as well as the proposed Kunzler Quarry are closer to major population centers and geographical centers of the County, resulting in shorter trip lengths and correspondingly fewer vehicle miles traveled to transport the same amount of aggregate. These results are summarized in Table 8A, which is enclosed.

The proposed Kunzler Quarry would not produce asphalt concrete (AC) so this potential project did not affect the VMT calculation for AC production. For consistency with the report, VMT results for AC production are provided in Table 8A; however, this addendum does not change those results. Overall the Harris Quarry project has the potential to decrease the total VMT associated with hauling aggregate and AC within Mendocino County by approximately 183,500 VMT annually. When coupled with the near term cumulative increase in aggregate production associated with Kunzler Quarry, the two projects have the potential to reduce Countywide VMT for aggregate and AC distribution by 1.08 million miles annually.

It is anticipated that VMT related to aggregate demand will increase in the future as population and demand for aggregate increases in Mendocino County and the relationships developed based upon 2000 population data will remain valid in the future. As the demand for aggregate increases, while production levels within Mendocino County remain constant, the shortfall will be filled by out-of-County sources with these trips having greater travel distances, resulting in higher VMT overall. Conversely, the expansion of the Harris Quarry together with cumulative near term increase in production will result in fewer VMT in the future as a greater portion of the total demand will be met by quarries within Mendocino County and less by out-of-County sources.

The increased aggregate production with the Harris Quarry project and the near term cumulative increase in regional aggregate production will reduce the need to import aggregate into the County as more of the demand will be met by local sources. However, this increase in aggregate production will not be expected to eliminate the need to import aggregate to meet current and future demand, but importation of aggregate will be significantly reduced and the local quarries will come closer to fulfilling the need for these products in Mendocino County.

Thank you for asking us to provide these services and we hope that this information addresses fully addresses VMT impacts for Harris Quarry. Please feel free to call if you have any questions.

Sincerely,

Tony Henderson, EIT
Assistant Transportation Engineer

Allan G. Tilton, PE
Senior Associate

AGT/tdh/MEX047.L3

Enclosure: Revised VMT Gravity Model Calculation (Revised Appendix F)
Table 8A – Vehicle Miles Traveled Summary

Copy: Ms. Cathy McKeon, Rau and Associates

Table 8A Vehicle Miles Traveled Summary							
Quarry Aggregate VMT	**Base Permit**		**Project**		**Project plus Near Term Cumulative**		**Change In VMT**
	Annual Trips	**Annual VMT**	**Annual Trips**	**Annual VMT**	**Annual Trips**	**Annual VMT**	
Harris	3,719	98,761	7,550	225,263	9,420	355,943	257,182
Davis Pit	3,721	322,636	3,579	318,899	970	96,567	-226,069
Keithly Ranch	4,959	415,506	4,747	401,631	1,303	126,538	-288,968
DNA River	1,240	145,695	1,209	144,970	217	28,896	-116,799
Cooks Humboldt	992	133,202	973	129,297	177	22,617	-110,585
Ford Gravel	9,920	287,671	8,096	236,262	9,649	372,762	85,091
Ten Mile	2,480	75,480	2,018	58,816	2,693	74,219	-1,261
Pieta	2,481	109,033	2,058	89,771	2,070	61,471	-47,562
Layton Rock	2,480	69,650	2,088	47,997	2,463	61,471	-8,179
Cooks Valley	2,480	329,488	2,420	319,171	513	65,387	-264,101
Wisley Ranch	744	25,178	591	19,419	814	25,373	195
Coal Mine	1,241	108,060	1,199	104,864	353	28,241	-79,819
Syar Healdsburg	2,449	326,041	2,412	319,551	447	65,321	-260,720
Kunzler	0	0	0	0	7,845	130,187	130,187
Total	***38,936***	***2,446,401***	***38,940***	***2,415,911***	***38,934***	***1,514,993***	***-931,408***
Plant (AC VMT)							
Harris	0	0	2,644	85,621	2,644	85,621	85,621
Granite	7,499	284,767	5,444	183,063	5,444	183,063	-101,704
Baxman	1,718	71,146	1,815	61,089	1,815	61,089	-10,057
Bodean/Syar (Santa Rosa)	2,501	445,239	1,816	318,347	1,816	318,347	-126,892
Total	***11,718***	***801,152***	***11,719***	***648,120***	***11,719***	***648,120***	***-153,032***
Project Total	**50,654**	**3,247,553**	**50,659**	**3,064,031**	**50,653**	**2,163,113**	**-1,084,440**
Note: VMT = Vehicle miles traveled							

Errata 1 – Page 28, Table 17 should read: (red text indicates change)

Table 17
US 101/Black Bart Drive Project Level of Service Calculations – Peak Production

Condition	Production Period	9-10 AM		11 AM-noon		1:15-2:15 PM		4:45-5:45 PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
2010 Project	July	16.2	C	27.6	D	20.5	C	19.7	C
Mitigated (turn lanes)	*July*	*13.3*	*B*	*17.3*	*C*	*14.6*	*B*	*14.3*	*B*
	October	13.7	B	19.6	C	21.0	C	15.0	B
Mitigated (turn lanes)	*October*	*12.1*	*B*	*14.7*	*B*	*15.1*	*C*	*12.5*	*B*
2014 Project	July	17.2	C	32.4	D	23.2	C	21.8	C
Mitigated (turn lanes)	*July*	*13.9*	*B*	*18.6*	*C*	*15.4*	*C*	*15.1*	*C*
	October	14.2	B	21.7	C	20.6	C	16.2	C
Mitigated (turn lanes)	*October*	*12.4*	*B*	*15.4*	*C*	*15.9*	*C*	*13.0*	*B*
2014 Project w/Bypass	July	17.7	C	33.6	D	23.7	C	22.5	C
Mitigated (turn lanes)	*July*	*14.0*	*B*	*18.9*	*C*	*15.6*	*C*	*15.1*	*C*
	October	14.6	B	22.5	C	24.3	C	16.2	C
Mitigated (turn lanes)	*October*	*12.6*	*B*	*15.7*	*C*	*16.2*	*C*	*13.0*	*B*
2030 Project	July	23.8	C	**72.6**	**F**	**42.9**	**E**	**40.5**	**E**
Mitigated (turn lanes)	*July*	*16.3*	*C*	*25.1*	*D*	*19.6*	*C*	*19.6*	*C*
	October	17.6	C	34.4	D	40.0	E	22.6	C
Mitigated (turn lanes)	*October*	*13.9*	*B*	*19.0*	*C*	*19.9*	*C*	*15.2*	*C*
2040 Project	July	30.9	D	**	**F**	**73.0**	**F**	**68.7**	**F**
Mitigated (turn lanes)	*July*	*18.3*	*C*	*31.4*	*D*	*23.2*	*C*	*22.4*	*C*
	October	20.6	C	**50.6**	**E**	**63.4**	**F**	29.6	D
Mitigated (turn lanes)	*October*	*15.1*	*C*	*22.1*	*C*	*23.3*	*C*	*16.9*	*C*

Notes: Delay is in average number of seconds per vehicle; LOS = Level of Service;
Bold = deficient operation; ** = greater than 120 seconds of average delay

Errata 2 – Page 10, Table 6 should read: (red text indicates change)

Table 6 **Trip Generation Assumptions with Proposed Project**			
Source	Annual Production	Percent of Annual in:	
		July	October
Material Processed			
Material Mined	200,000 cy	n/a	n/a
Increased Material Volume by Bulking	48,000 cy	n/a	n/a
Recycle Material Imported	10,000 cy	9.4%	12.2%
Total Material Processed	***258,000 cy***		
Material Distributed			
Aggregate Production For Sale	162,520 cy	9.4%	12.2%
Aggregate transferred to Willits for PCC	37,200 cy	10.0%	15.8%
AC Production	58,280 cy	12.0%	17.0%
Total Material Distributed	*258,000 cy*		

Errata 3 –Appendix C, Page 1, last section should read:

Project – Annual Production

Errata 4 – The attached pages are to be added to Appendix G.

Appendix D

Background Air Quality Data

ANALYSIS OF TERRAIN MODIFICATIONS TO LOCAL WEATHER CONDITIONS FOR THE PROPOSED HARRIS QUARRY PROJECT

Prepared for

Leonard Charles & Associates
7 Roble Court
San Anselmo, CA. 94960

Prepared By

Atmospheric Dynamics, Inc.
Santa Barbara, CA. 93105



August 2007

The Harris Quarry is located approximately seven (7) miles south of Willits and 19 miles north of Ukiah. The Pacific Ocean lies approximately 25 miles to the west of the Quarry. The quarry sits at an elevation of 1,850 feet above mean sea level (MSL) with the top of the quarry hill at 2,345 meet MSL. Terrain in the immediate vicinity of the Harris Quarry is varied with terrain features that exceed the height of the Harris Quarry. Towards the west, Irene Peak rises up to 2,700 feet MSL while towards the east; Laughlin Range rises to heights exceeding 3,200 feet MSL. Phase I of the project will remove material from the southern edge of the hill, but the base elevation of the quarry will remain the same at 1,850 feet MSL. Phase II will lower the quarry floor to 1,750 MSL and the final phase (Phase III) will further lower the quarry floor to 1,650 feet MSL. The project site lies at the summit of the valley pass (Ridgewood Summit) that decreases in elevation towards the south and southeast. The valley pass is bounded by terrain on both sides until it reaches the Redwood Valley.

The principal topographical features in the project region between Willits Valley and the coast are the northwest to southeast oriented ridges and canyons. Maximum elevations are found along the eastern boundary and range from about 4,500 to 7,500 feet. Black Butte and Anthony Peak are prominent mountains with elevations of more than 6,500 feet. Gently sloping terraces ranging from 100 to 700 feet in elevation are found a few miles inland from the coast. The relatively flat valley of Willits is located in the mountainous part of the basins. Terrain in the vicinity of the project site ranges from 1,400 feet MSL upwards to over 3000 feet MSL. Terrain to the west, northwest, and southwest are made up of ridges and mountains that that are equal to or exceed the height of terrain at the project site. Terrain to the east, northeast, and southeast is significantly higher.

These large scale topographical features between the ocean and the project area modify the coastal weather conditions in a large way. The project area is in a transition zone between the coastal areas and the northeastern interior sections of Mendocino County. Some periods in the Willits Valley may be dominated by air masses characteristic of the coastal areas while at other times, the air masses of the interior zones may dominate. It does appear that coastal winds reach inland to Willits, but this air mass is greatly modified by the large-scale (mesoscale) terrain features as it moves inland. This is evidenced by the dramatic changes in air temperature, wind speed, and wind direction from that of the coastal observations and are a product of differential heating (or cooling during winter months or at night), a significant wind speed decrease due to frictional effects, and a change in wind direction that are all forced by the northwest/southeast oriented ridges and canyons.

On an annual basis, winds along the coastal waters are a direct effect of the Pacific High, which is a large-scale high pressure zone located offshore. Inland winds appear to also be indirectly affected by the Pacific High. Local topography can influence the direction of these winds through direct channeling. Topography can also influence the generation of a sea breeze circulation through the generation of localized pressure gradients. Hills and valleys near a coastline may generate or accentuate the sea breeze if southerly facing slopes or inland valleys heat up more than surrounding coastal land. Once the sea breeze begins, hills, valleys, and ridges can dramatically affect its direction through forced channeling in a manner that is identical to the flow of winds from the Pacific High. The fairly strong low-level marine inversion, predominant along the coastal areas, also aids in the steering effects, forcing the sea breeze around hills rather than over them. During the winter months, some of the winds experienced in the project area are from drainage winds that occur during the nighttime hours. This type of wind is caused by cooler, denser air that descends to lower elevations through the effects of gravity. These winds, although of generally low wind speed, are forced by terrain as they flow down valleys and canyons. Thus, Pacific High winds and terrain induced flows can either be channeled directly due to predominant terrain features or be forced through pressure channeling from the generation of localized sea breezes.

Typically, during periods of stable atmospheric conditions and during periods of inversions, the atmosphere is resistant to vertical displacement. Buoyancy forces will try to return vertically displaced air parcels to their original level even if such restoration causes winds to go around rather than over a mountain, which can cause the generation of strong winds. The Willits Valley is often subjected to stable atmospheric conditions and inversions, especially during the fall and winter months and possibly during nighttime hours. Thus, the area has a predominant complex pattern of winds being steered by large-scale terrain features with winds moving up/down canyon as well as around and sometimes over terrain.

Atmospheric circulations resulting from airflow over and around hills and mountains exist on many length scales, ranging from planetary waves (>1000 km) to minor perturbations over very small obstacles (< 5 km). Clearly the size of a given circulation (measured in terms of horizontal length) is frequently related to the size of the hill or mountain (called a forcing obstacle), but atmospheric conditions, particularly wind speed and stability, also play an important role. Thus, these terrain-induced circulations are partly due to forcing by mesoscale hills and partly due to atmospheric mechanisms that produce mesoscale circulations. In the presence of these large scale terrain features, the

smaller obstacles effects on winds and weather is often lost in the effects from the broader scale terrain.

Terrain on the east side of the Willits valley may block the wind flow from penetrating further east. The resultant wind flow based on the blocking effects of the eastern terrain, may move down-valley to form a small convergence zone in the southern end of the Willits valley. Winds may then move down the Ridgewood Summit towards Redwood Valley. It appears that the general winds in the Willits valley, especially the southern zone of the valley are predominately controlled by the mesoscale terrain features that exist on the east and west sides of the valley. No one terrain feature, other than the broad-scale northwest to southeast oriented ridges and canyons appear to moderate or control the winds and temperatures in the valley.

The proposed project, located near Ridgewood Summit, will require the removal of the top and southern portions of this existing small-scale terrain feature. The maximum height of the terrain feature of 2,345 feet MSL will be lowered by several hundred feet. Below the area of disturbance, the northern portion is not expected to change. Winds approaching Ridgewood Summit from the north during periods of convergence are already being channeled by the numerous larger scale terrain features on both sides of the Summit. The removal of the top and southern portions of the hill is not expected to cause any perceived changes in wind direction or wind speed in areas south or north of Ridgewood Summit since the larger scale terrain features around the project site are the predominant wind forcing (controlling) mechanisms is the area. Thus, no impacts to local weather are expected to occur.

EIR Air Quality Analysis

The following describes the methodology used for the EIR air quality analysis.

Methodology

The proposed project involves the expansion of the Harris Quarry and construction an asphalt plant. Operation of the quarry will remain essentially the same but the annual allowable production rate will increase from 75,000 cubic yards per year (168,750 tons per year) to a maximum of 200,000 cubic yards per year (450,000 tons per year). Once processed, the 200,000 cubic yards will yield about 248,000 cubic yards of loose material. The project will also import about 10,000 cubic yards of material for recycling (primarily concrete and asphalt). The total amount of aggregate produced by the project will be about 258,000 cubic yards of loose material.

Currently, all the quarry production is trucked off site for sales or to Willits to the applicant's concrete processing facility. With the project, about 37,200 cubic yards of aggregate and sand will be trucked to the concrete facility in Willits and about 58,280 cubic yards will be used by the new asphalt plant. The remainder, about 162,500 cubic yards, will be available for off site sales.

For the project, additional quarry processing or mobile equipment will not be required to achieve the production increase. However, as the quarry operations move further away from the processing site, 100 foot conveyors will be added to move the rock from the quarry face to the processing equipment. It is anticipated that one conveyor will need to be added every 10 years. Quarry operations will occur for more days per year than they currently operate and the quarry processing equipment will be operated at higher production rates, up to 400 tons per hour. The average hourly production rate will increase from about 217 tons per hour to about 300 tons per hour.

As part of the project a new paved internal haul road will be constructed to access the quarry and asphalt plant. This will replace the existing unpaved quarry access road. This will reduce dust emissions from the existing access road. A high-efficiency street sweeper will be used keep the paved areas clean and reduce particulate emissions.

Emissions from the proposed project will be generated at the quarry and asphalt plant, in addition to emissions from mobile sources operating at the project site and while traveling off site. On-site emission sources at the quarry include stationary, mobile, and fugitive sources. The stationary sources at the quarry include one large diesel generator (2,012 hp), two small diesel generators (22 hp and 30 hp), and sources associated primarily with quarry processing facility; a feeder, primary jaw crusher, two secondary cone crushers, three screens, conveyors, stacking conveyors, and one wash plant (in place, but non-operational). Emissions from these sources are minimized by use of water/foam spray systems on the crushers and at transfer and processing points to reduce any dust generated.

Other emission sources at the quarry include fugitive dust from quarry maintenance and excavation activities and aggregate loading into haul trucks via loaders. On-site mobile

equipment includes one bulldozer, three loaders (two in operation and one for spare use), one excavator, one Skidsteer, one rock drill rig, and one water truck used for dust suppression by watering the roads and work areas. Currently, the haul trucks traveling on the unpaved access road to the quarry and in the quarry area where the trucks are loaded and weighed also generate fugitive dust. These areas will be paved as part of the proposed project. Dust control at the quarry is achieved by watering work areas and roadways, and by wetting surge and storage piles to maintain adequate moisture to minimize airborne particulates. Exhaust emissions are also generated by the mobile sources.

The addition of the asphalt plant will introduce new equipment and emission sources to the project site. These facilities, as well as the quarry production increase, will require permitting through the MCAQMD and compliance with all MCAQMD regulations. The MCAQMD will require the use of Best Available Control Technology (BACT) for the new facility equipment. The evaluation and final determination of the required emission control equipment will be determined during the permitting process. While the applicant has proposed emission control equipment to meet BACT requirements, the MCAQMD may require additional or alternative emission control that are more effective than those proposed. This air quality analysis is based on the applicant's proposed emission control equipment. Thus, emissions and impacts from the proposed project may be lower than those evaluated if the MCAQMD requires more stringent emission controls.

Emission sources for the proposed asphalt and concrete plants include the following:

- A diesel-fueled countercurrent rotary asphalt dryer using a low-NOx burner and pulse jet baghouse to reduce PM emissions;
- Asphalt oil storage tanks;
- A diesel-fueled hot oil heater;
- Asphalt storage silos and truck load-outs, controlled by a Blue Smoke system or similar device;
- General activity for a front-end loader serving the asphalt plant;
- General activity areas trucks for carrying aggregate, asphalt oil and asphalt;
- Fugitive dust sources generating PM_{10} and PM2.5 (i.e., material delivery to ground storage, material transfer to conveyor, and material transfer to storage) at the asphalt plant;
- Paved roads and surfaces generating PM10 and PM2.5 emissions from trucks and mobile equipment.

A new loader, dedicated to handling materials at the asphalt plant, will be added as part of the project.

Emission of CO, NOx, VOCs, PM10, and PM2.5 were estimated based on hourly, daily and annual production rates, and expected hours of operation for the quarry and asphalt plant. Emissions of fugitive dust, quarry processing equipment, and the asphalt plant equipment were calculated using the U.S. EPA's AP-42 Compilation of Air Pollutant Emission Factors. Asphalt plant toxic air contaminant emissions were also calculated using AP-42 emission factors. Exhaust emissions from the on-site mobile equipment at the quarry and processing site were calculated using emission factors from the CARB's OFFROAD2007 emissions model. Haul truck exhaust emissions were estimated using

the CARB's on road emissions model, EMFAC2007. The emission factors used and the resulting emission estimates are shown in detail in this appendix.

In addition to estimating criteria pollutant and toxic air contaminant emissions from project operations, emissions of carbon dioxide were estimated. Carbon dioxide is the primary GHG that will be emitted from fuel combustion associated with project sources. Other GHGs will be emitted but in minor amounts. The emission calculations are included with the criteria pollutant calculations in this appendix.

As part of the health risk assessment, air quality dispersion modeling was used to estimate hourly and annual average toxic air contaminant concentrations from the quarry under baseline production levels and from the proposed project. Concentrations were calculated in areas of identified sensitive receptors. The sensitive receptor areas included in the modeling were the Church of the Golden Rule, the Golden Rule Mobile Village, residents in the Black Bart Road area and the old commercial area at Black Bart Road and Highway 101, and at the Mendocino CAL FIRE Headquarters north of the site and on the east side of Highway 101. Figure 3.6-1 shows the quarry and asphalt plant sites, property boundary, and sensitive receptor locations where concentrations were calculated.

Air quality dispersion modeling was conducted using the EPA's Industrial Complex – Short Term model (ISCST3) atmospheric dispersion model. The ISCST3 model is a steady-state, multiple source Gaussian dispersion model designed for use with emission sources situated in complex terrain where ground elevations can exceed the emission source heights. It can simulate the dispersion of pollutants from a variety of emission source types, including point, area, volume, and line sources, such as those associated with the proposed project. The ISCST3 model uses hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. The model assumes there is no variability in meteorological parameters over a 1-hour time period, hence the term steady state.

Meteorological data from a monitoring station in Willits for February 1, 2004 to January 31, 2005 were used with the ISCST3 model. This monitoring station was located at the former Apex/Remco chrome plating facility in Willits. It was operated in accordance with U.S. EPA protocols between April 2003 and July 2005 (a description of the meteorological data collection is at the end of this appendix). Rural dispersion coefficients were selected because the area consists of open space and lightly developed land uses. The Willits meteorological monitoring site is about 4.7 miles northwest of the project site and is the closest meteorological monitoring station to the

project area.[1] A wind rose illustrating prevailing wind speeds and directions during February 1, 2004 to January 31, 2005 is shown at the end of this appendix.

Emissions from the diesel generators, asphalt plant dryer baghouse stack, and hot oil heater were modeled as point sources. Emissions from the asphalt silo, truck load-out, and exhaust emissions from the loader at the asphalt plant were modeled as volume sources. Exhaust and fugitive dust emissions (for crystalline silica) from off-road mobile equipment at the quarry and quarry processing equipment were modeled as area sources. Emissions from haul trucks on the unpaved haul road (existing quarry operations) were modeled as line sources comprised of a series of volume sources. Exhaust emissions from haul trucks traveling within the project site and while off site on Highway 101 were also modeled as line sources.

The results of the modeling were used as input to CARB's Hotspots Analysis and Reporting Program (HARP) model to calculate potential cancer risks and non-cancer acute and chronic health effects for all toxic air contaminants except for crystalline silica. For crystalline silica, fugitive PM10 emissions from quarry operations were modeled with the ISCST3 model to obtain maximum annual concentrations at sensitive receptor locations. Crystalline silica concentrations were estimated as 10 percent of the PM10 concentrations, based on measured crystalline silica content of quarry materials.

[1] The MCAQMD operates a meteorological monitoring station in Willits; however, the data collection and quality assurance has not always been performed in accordance with U.S. Environmental Protection Agency protocols. At the suggestion of Dean Wolbach, Air Pollution Control Officer of the MCAQMD, Impact Sciences, Inc. contacted the Environmental Health Investigations Branch (EHIB) of Department of Health Services. In June 2004, EHIB released a public health assessment (PHA) of the former Abex/Remco Hydraulic Corporation chrome plating facility in Willits. The PHA relied on dispersion modeling conducted by the U.S. Public Health Service, Agency for Toxic Substances and Disease Registry, using the MCAQMD meteorological data. As an alternative to obtaining the model-ready meteorological data from ATSDR, DHS indicated that Precise Environmental Consultants, a consultant for Remco, may have a copy of the data used in the PHA. David Suder of Precise Environmental Consultants told Impact Sciences, Inc. that better meteorological data, collected at the Remco site in Willits and reviewed in accordance with USEPA protocols, were available, but not in a format for dispersion modeling. (The PHA also indicates that the MCAQMD data used in that assessment had data inconsistencies.) Mr. Suder provided the meteorological data in a model-ready format. Although the data extended from April 2003 to July 2005, Mr. Suder suggested using the data for the 12-month period from February 1, 2004 to January 31, 2005, due to errors in the data collection or excessive missing data in other portions of the monitoring period.

Criteria Pollutant and GHG Emission Calculations

Proposed Harris Quarry - Daily and Annual Emissions From Vehicle Travel - 2010
Daily and Annual Emissions From Vehicle Travel

Average Daily Emissions

Trip Type	Average Daily Trips*	Trip Length (mi)	Average Daily Emissions (lb/day) NOx	CO	VOC	PM10 (exhaust)	PM10 (total)	PM2.5 (exhaust)	PM2.5 (total)	CO2
On-site Travel										
Trucks - Access Road to Quarry	162	0.16	3.10	1.30	0.41	0.09	0.09	0.08	0.08	272.82
Trucks - Quarry Travel	196	0.09	5.17	2.22	0.53	0.11	0.11	0.10	0.10	355.12
Trucks - Quarry to Asphalt Plant	52	0.58	2.72	1.13	0.40	0.09	0.10	0.08	0.08	270.85
Trucks - Off-site to Asphalt Plant	52	0.23	1.20	0.50	0.17	0.04	0.04	0.03	0.03	114.55
Subtotal			12.2	5.2	1.5	0.3	0.3	0.3	0.3	1013.3
Off-Site Travel										
Trucks - Aggregate	122	30	105.66	19.16	4.66	3.39	3.91	3.12	3.29	13485.06
Trucks - Asphalt	52	30	45.03	8.17	1.98	1.45	1.67	1.33	1.40	5747.73
Turcks - Transfer to Willits	22	6	4.00	0.77	0.18	0.13	0.14	0.12	0.12	496.68
Trucks - Other	18	22	11.48	2.10	0.51	0.37	0.42	0.34	0.36	1461.86
Worker Vehicles - Commute	33	22	1.33	7.05	0.27	0.03	0.07	0.03	0.04	674.09
Subtotal			167.5	37.2	7.6	5.4	6.2	4.9	5.2	21865.4
Total			**179.7**	**42.4**	**9.1**	**5.7**	**6.5**	**5.2**	**5.5**	**22878.8**

* Based on number of average daily trips in July.

		178.4	35.3	8.8		6.5		5.5	22204.7

Annual Average Emissions (tons/year)

Trip Type	Annual Trips	Trip Length (mi)	Annual Emissions (tons/year) NOx	CO	VOC	PM10 (exhaust)	PM10 (total)	PM2.5 (exhaust)	PM2.5 (total)	CO2
On-site Travel										
Trucks - Off-site to Quarry	28,865	0.16	0.28	0.12	0.04	0.008	0.008	0.007	0.007	24.31
Trucks - Quarry Travel	31,320	0.09	0.41	0.18	0.04	0.008	0.009	0.008	0.008	28.37
Trucks - Quarry to Asphalt Plant	7,285	0.58	0.19	0.08	0.03	0.006	0.007	0.006	0.006	18.97
Trucks - Off-site to Asphalt Plant	7,285	0.42	0.12	0.05	0.02	0.004	0.005	0.004	0.004	12.84
Subtotal			1.0	0.4	0.1	0.027	0.028	0.024	0.025	84.5
Off-Site Travel										
Trucks - Aggregate	20,315	30	8.80	1.6	0.39	0.282	0.33	0.26	0.27	1122.74
Trucks - Asphalt	7,285	30	3.15	0.6	0.14	0.101	0.12	0.09	0.10	402.62
Trucks - Transfer to Willits	3,720	6	0.34	0.1	0.02	0.011	0.01	0.01	0.01	41.99
Trucks - Other	4,830	22	1.54	0.3	0.07	0.049	0.06	0.05	0.05	196.12
Worker Vehicles - Commute	5,574	22	0.11	0.60	0.02	0.003	0.01	0.00	0.00	56.93
Subtotal			13.9	3.1	0.6	0.446	0.5	0.4	0.4	1820.4
Total			**14.9**	**3.53**	**0.8**	**0.5**	**0.5**	**0.4**	**0.5**	**1905**

* Based on annual production levels and truck capacities.

		14.8	2.9	0.7		0.5		0.5	1848.0

Emission Factors

Vehicle Type	Travel Speed (mph)	Emission Factor Units	NOx	CO	VOC	PM10 (Exhaust)	PM10 (Total)	PM2.5 (Exhaust)	PM2.5 (Total)	CO2
Heavy-Duty Diesel Trucks (HHD)	10	gram/VMT	24.244	9.665	4.745	1.157	1.221	1.003	1.024	3165.45
Heavy-Duty Diesel Trucks (HHD)	55	gram/VMT	12.932	2.303	0.564	0.418	0.482	0.385	0.406	1662.35
Heavy-Duty Diesel Trucks (HHD)	Idle	gram/hour	117.002	51.181	9.432	1.673	1.673	1.539	1.539	6390.88
Worker Vehicles (LDT2)	60	gram/VMT	0.83	4.404	0.168	0.02	0.041	0.018	0.025	421.156

Emission factors from EMFAC2007

Truck idle time (min) = 5

Harris Quarry Off-Road Equipment Exhaust Emissions
Quarry Operation at Existing Permmitted Production - 2010

Analysis Year = 2010 Existing Equipment

Item No.	Equipment Type	No. Units	Engine Age (years)	Engine Model Year	Daily Hours In Use	Days Per Year	Unit Annual Hours Use	Use Factor	Load Factor	Cumulative Hours Operation Per Unit	Engine (hp)	Level of VDECS Used	Emission Factor (g/hp-hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
													NOx	CO	VOC	PM10	SO2	CO2	NOx	CO	VOC	PM10	SO2	CO2	NOx	CO	VOC	PM10	SO2	CO2
Quarry Equipment																														
1	2,012 hp Generator	1	3	2007	9	140	1260	1.00	0.74	3,780	2012	3	3.75	1.19	0.20	0.015	0.006	568.3	110.9	35.2	5.8	0.4	0.17	16789	7.76	2.47	0.41	0.03	0.012	1175
2	30 hp Generator (well)	1	5	2005	4	140	560	1.00	0.74	2,800	30	0	4.95	3.85	0.56	0.37	0.007	568.3	1.0	0.8	0.1	0.1	0.00	111	0.07	0.05	0.01	0.01	0.000	8
3	22 hp Generator (scale	1	18	1992	9	140	1260	1.00	0.74	22,680	22	0	6.44	5.00	1.84	0.55	0.007	568.3	2.1	1.6	0.6	0.2	0.00	184	0.15	0.11	0.04	0.01	0.000	13
4	Cat 980C Loader	1	12	1998	8	140	1120	0.00	0.54	21,000	270	0	7.11	1.14	0.45	0.20	0.006	568.3	0.0	0.0	0.0	0.0	0.00	0	0.00	0.00	0.00	0.00	0.000	0
5	Cat 980F Loader	1	17	1993	8	140	1120	1.00	0.54	26,500	275	0	9.12	3.34	0.96	0.45	0.006	568.3	23.9	8.8	2.5	1.2	0.01	1488	1.67	0.61	0.18	0.08	0.001	104
6	Cat 980G Loader	1	14	1996	8	140	1120	1.00	0.54	25,900	300	0	7.11	1.14	0.45	0.20	0.006	568.3	20.3	3.3	1.3	0.6	0.02	1624	1.42	0.23	0.09	0.04	0.001	114
7	Cat 226B Skid Steer	1	4	2006	4	140	560	1.00	0.54	2,240	61	0	4.91	3.27	0.25	0.22	0.007	568.3	1.4	1.0	0.1	0.1	0.00	165	0.10	0.07	0.01	0.00	0.000	12
8	Cat D11R Bulldozer	1	7	2003	8	140	1120	1.00	0.64	15,800	850	0	7.11	1.14	0.45	0.20	0.006	568.3	68.2	10.9	4.4	1.9	0.05	5453	4.77	0.76	0.31	0.13	0.004	382
9	Cat 345BL Excavator	1	2	2008	8	140	1120	1.00	0.57	2,240	300	0	2.39	0.96	0.16	0.10	0.006	568.3	7.2	2.9	0.5	0.3	0.02	1714	0.50	0.20	0.03	0.02	0.001	120
	TOTAL	-			-	-	-	-	-	-	-		-	-	-	-			**235.0**	**64.4**	**15.3**	**4.7**	**0.3**	**27,527**	**16.45**	**4.51**	**1.07**	**0.33**	**0.019**	**1,927**
	Quarry equipment without generators -->																		**121.0**	**26.8**	**8.7**	**4.0**	**0.1**	**10444**	**8.47**	**1.87**	**0.61**	**0.279**	**0.01**	**731**

***** Tier 1 engine (~1978), Rebuilt in 2005

Emission Factors - Off-Road Compression Ignited Engines

Item No.	EF ID	NOx ZH EF (g/hp-hr)	NOx DR (g/hp-hr^2)	NOx Fuel CF	CO ZH EF (g/hp-hr)	CO DR (g/hp-hr^2)	CO Fuel CF	ROG ZH EF (g/hp-hr)	ROG DR (g/hp-hr^2)	ROG Fuel CF	PM10 ZH EF (g/hp-hr)	PM10 DR (g/hp-hr^2)	PM10 Fuel CF	CO2 ZH EF (g/hp-hr)	CO2 DR (g/hp-hr^2)	CO2 Fuel CF	SO2 (g/hp-hr)
1	ULSD99992007	4.51	6.32E-05	0.95	0.92	1.82E-05	1.00	0.14	2.22E-05	1.00	0.11	6.03E-06	0.80	568.30	0.00E+00	1.00	0.006
2	ULSD502005	4.95	9.67E-05	0.95	3.00	3.05E-04	1.00	0.37	6.90E-05	1.00	0.38	2.93E-05	0.80	568.30	0.00E+00	1.00	0.007
3	ULSD251992	6.92	0.00E+00	0.93	5.00	0.00E+00	1.00	1.84	0.00E+00	1.00	0.76	0.00E+00	0.72	568.30	0.00E+00	1.00	0.007
4	ULSD5001998	6.25	1.04E-04	0.95	0.92	1.82E-05	1.00	0.32	1.12E-05	1.00	0.15	7.96E-06	0.80	568.30	0.00E+00	1.00	0.006
5	ULSD5001993	8.17	1.36E-04	0.93	2.70	5.35E-05	1.00	0.68	2.37E-05	1.00	0.38	2.02E-05	0.72	568.30	0.00E+00	1.00	0.006
6	ULSD5001996	6.25	1.04E-04	0.95	0.92	1.82E-05	1.00	0.32	1.12E-05	1.00	0.15	7.96E-06	0.80	568.30	0.00E+00	1.00	0.006
7	ULSD1202006	5.01	7.45E-05	0.95	3.09	8.21E-05	1.00	0.19	2.71E-05	1.00	0.24	1.76E-05	0.80	568.30	0.00E+00	1.00	0.007
8	ULSD10002003	6.25	1.04E-04	0.95	0.92	1.82E-05	1.00	0.32	1.12E-05	1.00	0.15	7.96E-06	0.80	568.30	0.00E+00	1.00	0.006
9	ULSD5002008	2.45	3.18E-05	0.95	0.92	1.82E-05	1.00	0.10	2.50E-05	1.00	0.11	5.55E-06	0.80	568.30	0.00E+00	1.00	0.006

Notes ZH EF = Zero hour emission factor
DR = Deterioration rate
ULSD = Ultra low sulfur diesel (15 ppmw sulfur, 0.0015% sulfur)

Refs: CARB OFFFROAD2007 model (http://www.arb.ca.gov/msei/offroad/offroad.htm), December, 2006.
Stationary/Off-road engines ARB, "California's Emissions Inventory for Off-Road Large Compressio-Ignited (CI) Engines (> 25 HP)" MAC#99-32

Table 1
Harris Quarry
PM10 and PM2.5 Emissions From Quarry Processing Operations
Existing Permitted Production - 2010 and 2030

Quarry Production Rate Information

Annual Process Rate (bank yd^3/yr) =	75,000	
Annual Process Rate (loose yd^3/yr) =	93,000	
Annual Process Rate (ton/yr) =	156,938	
Max Hourly process rate (ton/hr) =	250	
Average Hourly process rate (ton/hr) =	217	
Max. Daily Process Rate (ton/day)	2,250	
Average Daily Process Rate (ton/day)	1,302	
Average to Maximum Process Rate Ratio =	0.87	
Days to Process Annual Amount =	121	(at average daily production level)
Days to Process Annual Amount =	70	(at max. daily production level)
Average Hours per day Processing (hrs) =	6	(at average daily production level)
Maximum Hours per day Processing (hrs) =	9	(at max. daily production level)

Quarry Processing Equipment Emissions - Baseline Conditions

Equipment Type	Process Rate (ton/hr)	Number of Transfers	Daily Operation (hours)	Emission Factor (lb/ton)	PM10 Emissions Hourly (lb/hr)	PM10 Emissions Daily (lb/day)	PM10 Emissions Annual (ton/yr)	Emission Factor (lb/ton)	PM2.5 Emissions Hourly (lb/hr)	PM2.5 Emissions Daily (lb/day)	PM2.5 Emissions Annual (ton/yr)
Feed Hopper	217	1	6	0.000016	0.003	0.02	0.001	0.000003	0.001	0.004	0.0003
Primary Jaw Crusher (CR1)	135	1	6	0.00054	0.073	0.44	0.026	0.00010	0.014	0.081	0.0028
Conveyor 1 to Screen (SC1)	217	1	6	0.000046	0.010	0.06	0.004	0.000013	0.003	0.017	0.0006
Coarse Screen (SC1)	217	1	6	0.00074	0.161	0.96	0.058	0.00005	0.011	0.065	0.0023
Conveyor 2 - Base Rock Transfer	39	1	6	0.000046	0.002	0.01	0.001	0.000013	0.001	0.003	0.0001
Cone Crusher (CR2)	152	1	6	0.00054	0.082	0.49	0.030	0.00010	0.015	0.091	0.0032
Conveyor 4 - Transfer to Screen (SC2)	172	1	6	0.000046	0.008	0.05	0.003	0.000013	0.002	0.013	0.0005
Fines Screen (SC2)	279	1	6	0.0022	0.613	3.68	0.222	0.00005	0.014	0.084	0.0029
Conveyor 5 - Sand Transfer	57	1	6	0.000046	0.003	0.02	0.001	0.000013	0.001	0.004	0.0002
Conveyor 9 - Transfer to Crusher (CR3)	222	1	6	0.000046	0.010	0.06	0.004	0.000013	0.003	0.017	0.0006
Cone Crusher (CR3)	280	1	6	0.00054	0.151	0.91	0.055	0.00010	0.028	0.168	0.0059
Conveyor 13 - Return from SC3 to CR3	58	1	6	0.000046	0.003	0.02	0.001	0.000013	0.001	0.005	0.0002
Conveyor 10 - Transfer to Screen (SC3)	280	1	6	0.000046	0.013	0.08	0.005	0.000013	0.004	0.022	0.0008
Coarse Screen (SC3)	168	1	6	0.00074	0.125	0.75	0.045	0.00005	0.008	0.051	0.0018
Conveyor 3/Loadout-Base Rock	39	2	6	0.00007	0.0052	0.03	0.002	0.000013	0.001	0.006	0.0002
Conveyor/Loadout-6' Cobble	6	2	6	0.00007	0.0008	0.00	0.000	0.000013	0.0002	0.001	0.00003
Conveyor 7/Loadout-3' Drain Rock	3	2	6	0.00007	0.0003	0.00	0.000	0.000013	0.0001	0.000	0.00001
Conveyor 8/Loadout-1.5" Drain Rock	2	2	6	0.00007	0.0002	0.00	0.000	0.000013	0.0000	0.000	0.00001
Conveyor 12/Loadout-3/4' Rock	18	2	6	0.00007	0.0024	0.01	0.001	0.000013	0.000	0.003	0.0001
Conveyor 11/Loadout-1/2" Rock	21	2	6	0.00007	0.0027	0.02	0.001	0.000013	0.001	0.003	0.0001
Conveyor 6/Loadout-Sand	127	2	6	0.00007	0.0167	0.10	0.006	0.000013	0.003	0.020	0.0007
Total Quarry Processing Equipment					***1.3***	***7.71***	***0.46***		***0.11***	***0.66***	***0.02***

Table 2
Harris Quarry
PM10 and PM2.5 From Quarry Fugitive Emission Sources
Baseline Conditions and Processing Rates

Quarry Excavation/Processing Fugitive Emission Sources - Baseline Conditions															
				Operation					PM10 Emissions			PM2.5 Emissions			
	Process Rate	Process Rate Units	No. of Equip.	Total Daily (hours)	Annual (hours/yr)	PM10 Emission Factor	PM2.5 Emission Factor	Emission Factor Units	Ave Hourly (lb/hr)	Ave Daily (lb/day)	Annual Average (ton/yr)	Ave Hourly (lb/hr)	Ave Daily (lb/day)	Annual Average (ton/yr)	
Loader Travel (quarry area) - Daily	9.7	mile/day	2	6	-	0.81	0.10	lb/VMT	1.32	7.91	-	0.16	0.95	-	
Loader Travel (quarry area) - Annual	1173	mile/yr	2	-	-	0.81	0.10	lb/VMT	-	-	0.48	-	-	0.06	
Bulldozing	-	-	1	8	964	0.41	0.28	lb/hr	0.41	3.28	0.20	0.28	2.21	0.13	
Excavator	217	ton/hr	2	8	964	0.0003	0.00004	lb/ton	0.06	0.50	0.03	0.01	0.08	0.00	
Loader Travel (truck loading)	1.2	mile/day	2	2	-	0.813	0.10	lb/VMT	0.49	0.99	-	0.06	0.12	-	
Truck Loading (via loader)	217	ton/hr	2	2	-	0.0003	0.00004	lb/ton	0.06	0.12	-	0.01	0.02	-	
Loader Travel - Annual	440	mile/yr	2	-	-	0.81	0.10	lb/VMT	-	-	0.18	-	-	0.02	
Truck Loading (via loader) - Annual	156,938	ton/yr	2	-	-	0.0003	0.00004	lb/ton	-	-	0.02	-	-	0.003	
Daily - On-Site Haul Truck Travel (quarry)	8	mile/day	-	2	-	0.555	0.055	lb/VMT	2.13	4.26	-	0.21	0.43	-	
Annual - On-Site Haul Truck Travel (quarry)	1062	mile/yr	-	-	-	0.412	0.041	lb/VMT	-	-	0.22	-	-	0.02	
Total Excavation/Processing Fugitives									***4.5***	***17.1***	***1.12***	***0.7***	***3.80***	***0.24***	
Total Processing and Fugitives									**5.76**	**24.77**	**1.59**		**3.91**	**0.90**	

Table 3
Harris Quarry
PM10 and PM2.5 Emissions From Quarry Processing Operations
Proposed Operations - 2010 and 2030

Quarry Production Rate Information

Annual Process Rate (bank yd^3/yr) =	200,000	
Annual Process Rate (loose yd^3/yr)* =	258,000	
Annual Process Rate (ton/yr) =	428,500	(includes 10,000 tons of imported recycling material)
Max Hourly process rate (ton/hr) =	400	
Average Hourly process rate (ton/hr) =	310	
Max. Daily Process Rate (ton/day)	4,000	
Average Daily Process Rate (ton/day)	2,480	
Average to Maximum Process Rate Ratio =	0.78	
Days to Process Annual Amount =	173	(at average daily production level)
Days to Process Annual Amount =	107	(at max. daily production level)
Average Hours per day Processing (hrs) =	8	(at average daily production level)
Maximum Hours per day Processing (hrs) =	10	(at max. daily production level)

Quarry Processing Equipment Emissions - Proposed Operations

	Process	Number	Daily	Emission	PM10 Emissions			Emission	PM2.5 Emissions		
Equipment Type	**Rate (ton/hr)**	**of Transfers**	**Operation (hours)**	**Factor (lb/ton)**	**Hourly (lb/hr)**	**Daily (lb/day)**	**Annual (ton/yr)**	**Factor (lb/ton)**	**Hourly (lb/hr)**	**Daily (lb/day)**	**Annual (ton/yr)**
Feed Hopper	310	1	8	0.000016	0.005	0.04	0.003	0.000003	0.001	0.008	0.0007
Primary Jaw Crusher (CR1)	194	1	8	0.00054	0.105	0.84	0.072	0.00010	0.019	0.155	0.0134
Conveyor 1 to Screen (SC1)	310	1	8	0.000046	0.014	0.11	0.010	0.000013	0.004	0.032	0.0028
Coarse Screen (SC1)	310	1	8	0.00074	0.229	1.84	0.159	0.00005	0.016	0.124	0.0107
Conveyor 2 - Base Rock Transfer	56	1	8	0.000046	0.003	0.02	0.002	0.000013	0.001	0.006	0.0005
Cone Crusher (CR2)	210	1	8	0.00054	0.113	0.91	0.078	0.00010	0.021	0.168	0.0145
Conveyor 4 - Transfer to Screen (SC2)	239	1	8	0.000046	0.011	0.09	0.008	0.000013	0.003	0.025	0.0021
Fines Screen (SC2)	398	1	8	0.0022	0.876	7.01	0.606	0.00005	0.020	0.159	0.0138
Conveyor 5 - Sand Transfer	79	1	8	0.000046	0.004	0.03	0.003	0.000013	0.001	0.008	0.0007
Conveyor 9 - Transfer to Crusher (CR3)	295	1	8	0.000046	0.014	0.11	0.009	0.000013	0.004	0.031	0.0026
Cone Crusher (CR3)	333	1	8	0.00054	0.180	1.44	0.124	0.00010	0.033	0.267	0.0230
Conveyor 13 - Return from SC3 to CR3	39	1	8	0.000046	0.002	0.01	0.001	0.000013	0.001	0.004	0.0003
Conveyor 10 - Transfer to Screen (SC3)	333	1	8	0.000046	0.015	0.12	0.011	0.000013	0.004	0.035	0.0030
Coarse Screen (SC3)	166	1	8	0.00074	0.123	0.98	0.085	0.00005	0.008	0.066	0.0057
Conveyors from Quarry Area	310	4	8	0.000046	0.057	0.46	0.039	0.000013	0.016	0.129	0.0111
Conveyor 3/Loadout-Base Rock	56	2	8	0.00007	0.0074	0.06	0.005	0.000013	0.001	0.012	0.0010
Conveyor/Loadout-6' Cobble	16	2	8	0.00007	0.0020	0.02	0.001	0.000013	0.0004	0.003	0.00028
Conveyor 7/Loadout-3' Drain Rock	12	2	8	0.00007	0.0016	0.01	0.001	0.000013	0.0003	0.003	0.00022
Conveyor 8/Loadout-1.5" Drain Rock	12	2	8	0.00007	0.0016	0.01	0.001	0.000013	0.0003	0.003	0.00022
Conveyor 12/Loadout-3/4' Rock	16	2	8	0.00007	0.0021	0.02	0.001	0.000013	0.000	0.003	0.0003
Conveyor 11/Loadout-1/2" Rock	16	2	8	0.00007	0.0021	0.02	0.001	0.000013	0.000	0.003	0.0003
Conveyor 6/Loadout CL2 Base	102	2	8	0.00007	0.0135	0.11	0.009	0.000013	0.003	0.021	0.0018
Total Quarry Processing Equipment					***1.8***	***14.25***	***1.23***		***0.16***	***1.26***	***0.11***

* Includes 10,000 tons of imported recycle material

Table 4
Harris Quarry
PM10 and PM2.5 From Quarry Fugitive Emission Sources
Proposed Operations

Quarry Excavation/Processing Fugitive Emission Sources - Proposed Operations														
				Operation					PM10 Emissions			PM2.5 Emissions		
	Process Rate	Process Rate Units	No. of Equip.	Total Daily (hours)	Annual (hours/yr)	PM10 Emission Factor	PM2.5 Emission Factor	Emission Factor Units	Ave Hourly (lb/hr)	Ave Daily (lb/day)	Annual Average (ton/yr)	Ave Hourly (lb/hr)	Ave Daily (lb/day)	Annual Average (ton/yr)
Loader Travel (quarry area) - Daily	10.4	mile/day	2	6	-	0.81	0.10	lb/VMT	1.42	8.49	-	0.17	1.02	-
Loader Travel (quarry area) - Annual	2405	mile/yr	2	-	-	0.81	0.10	lb/VMT	-	-	0.98	-	-	0.12
Bulldozing	-	-	1	9	1555	0.41	0.28	lb/hr	0.41	3.68	0.32	0.28	2.48	0.21
Excavator	310	ton/hr	2	9	1555	0.0003	0.00004	lb/ton	0.09	0.80	0.07	0.01	0.12	0.01
Loader Travel (truck loading)	2.0	mile/day	2	3	-	0.81	0.10	lb/VMT	0.53	1.59	-	0.06	0.19	-
Truck Loading (via loader)	310	ton/hr	2	3	-	0.0003	0.00004	lb/ton	0.09	0.27	-	0.01	0.04	-
Loader Travel - Annual	902	mile/yr	2	-	-	0.81	0.10	lb/VMT	-	-	0.37	-	-	0.04
Truck Loading (via loader) - Annual	428,500	ton/yr	2	-	-	0.0003	0.00004	lb/ton	-	-	0.06	-	-	0.009
Daily - On-Site Haul Truck Travel (quarry)	36	mile/day	-	2	-	0.185	0.018	lb/VMT	3.31	6.62	-	0.33	0.66	-
Annual - On-Site Haul Truck Travel (quarry)	2901	mile/yr	-	-	-	0.137	0.014	lb/VMT	-	-	0.20	-	-	0.02
Total Excavation/Processing Fugitives									***5.8***	***21.5***	***1.99***	***-***	***4.52***	***0.42***
Total Processing and Fugitives									**7.63**	**35.71**	**3.22**		**4.68**	**1.68**

Table 5
Harris Quarry
Emissions Factors Used For Quarry Processing and Fugitive PM10 & PM2.5 Emissions

	PM10 Emission Factors			PM2.5 Emission Factors				
Emission Source	**Uncontrolled**	**% Control**	**Controlled**	**Uncontrolled**	**Fraction of PM10**	**Controlled**	**Units**	**Reference**
Feed Hopper	0.000016	0%	0.000016	0.00000	0.20	0.000003	lb/ton	8/04AP-42 Section 11.19.2 (Crushed Stone Processing) - uncontrolled
Primary Crushing	-	-	0.00054	-	-	0.00010	lb/ton	8/04 AP-42 Section 11.19.2 (Crushed Stone Processing) - tertiary crushing (conservative estimate for primary crusher)
Secondary Crushing	-	-	0.00054	-	-	0.00010	lb/ton	8/04 AP-42 Section 11.19.2 (Crushed Stone Processing) - tertiary crushing (conservative estimate for primary crusher)
Screening	0.0087	-	0.00074	-	-	0.00005	lb/ton	8/04AP-42 Section 11.19.2 (Crushed Stone Processing) - Screening - controlled
Fines Screening	0.072	-	0.0022	-	-	0.00005	lb/ton	8/04AP-42 Section 11.19.2 (Crushed Stone Processing) - Fines screening - controlled
Conveyor Transfer Points	0.011	-	0.000046	-	-	0.000013	lb/ton	8/04 AP-42 Section 11.19.2 (Crushed Stone Processing) - Conveyor transfer point - controlled
Loading/stockpiling*	0.0003	70%	0.00009	0.00004	0.15	0.000013	lb/ton	11/06 AP-42 Section 13.2.4 (Aggregate handling and Storage Piles) - Material drop operations
Avg of Conveyor Transfer + Stockpiling	0.0056		0.00007	-		0.000013	lb/ton	
Haul Truck Quarry Unpaved Travel (daily)*	1.85	70%	0.555	0.185	-	0.055	lb/VMT	AP-42 Unpaved Roads
Haul Truck Quarry Unpaved Travel (Annual)*	1.37	70%	0.412	0.137	-	0.041	lb/VMT	AP-42 Unpaved Roads
Haul Truck Quarry Paved Travel (daily)**	1.85	90%	0.185	0.185		0.018		
Haul Truck Quarry Ppaved Travel (Annual)**	1.37	90%	0.137	0.137		0.014		
Bulldozing (lb/hr)	0.41	0%	0.41	- 0.28	-	0.28		AP-42 Western Surface Coal mining (overburden dozing)

Note: * Controlled emission factor assumes 70% control effectiveness for watering and reduced speed

** Controlled emission factor assumes 90% control effectiveness for paving, watering and reduced speed

On-Site Equipment Unpavved Road Emission Factors

Equipment Type	**Average Weight (tons)**	**Silt Content (%)**	**PM10 Uncontrolled Factor (lb/VMT)**	**PM10 Controlled Factor (lb/VMT)**	**PM2.5 Uncontrolled Factor (lb/VMT)**	**PM2.5 Controlled Factor (lb/VMT)**
Existing						
Cat 980G Loader	35.1	8.3	3.25	0.81	0.33	0.10
Cat 980F Loader	35.1	8.3	3.25	0.81	0.33	0.10
Proposed						

Note: * Controlled emission factor assumes 75% control effectiveness for watering and reduced speed

Vehicle/Process/Emission Factor Information		
Loader Capacity	6	cubic yards
On-site truck haul distance (access road) =	830	feet
On-site truck haul distance (quarry) =	965	feet
Haul Truck Capacity (tons) =	27	(16 cu. yd truck capacity)
Average Haul Truck Wt. (load & no load)	28	tons
Ave. No. Trucks per day (baseline) =	42	trucks/day
Annual No. Trucks (baseline) =	5,813	trucks/year
Ave. No. Trucks per day (proposed) =	196	trucks/day
Annual No. Trucks - aggregate (proposed) =	15,870	trucks/year
Average wind speed (mph)	4.7	Willits met data
No. days with precip. > 0.01 inch	94	NWS Station 1 NE, Willits, Ca
Material Moisture content (%) =	5	Applicant
Access Road Silt Content (%)	5	AP-42& use of lignin
Material Silt Content (%) =	3	Assumed

Harris Quarry - Fugitive Dust From Truck Travel on Existing Access Road to Quarry
Existing Permitted Production 2010 & 2030

Haul Trucks on Unpaved Access Road

Emission Factor (1)

$E = k * (s/12)^{0.9} * (W/3)^{0.45}$ [maximum hour]

$E = k * (s/12)^{0.9} * (W/3)^{0.45} * (365 - P)/365$ [average day]

E(PM10)	PM10 emission factor	1.818	lb/VMT
E(PM2.5)	PM2.5 emission factor	0.182	
k(PM10)	PM10 particle size multiplier	1.5	lb/VMT
k(PM2.5)	PM2.5 particle size multiplier	0.15	
s (2)	silt content	5	%
W	weight (empty)	14	tons
	weight (loaded)	39	tons
	weight (mean)	27	tons
P	days of rainfall > 0.01 in	94	days

Daily	PM10	PM2.5
trips/day (one way)	84	84
ft/trip (quarry access road)	830	830
mi/trip	0.157	0.157
Hours operation at max capacity	9	9
VMT/day	13.2	13.2
control efficiency for watering roads/reduced s	70%	70%
lb/day	7.20	0.720
Annual		
trips/yr (one way)	5,815	5,500
VMT/yr	1,828	1,729
lb/yr	997.2	94.3
ton/yr	0.499	0.05

Notes:

1. Emission factors from AP-42, Section 13.2.2 (Unpaved Roads).
2. Silt content from Section AP-42 and use of lignin on road
3. Control efficiency is assumed to be 70% for use of road treatment (lignin), watering, and reduced travel speed

Harris Quarry Existing Permitted Production - 2030
Daily and Annual Emissions From Vehicle Travel

Trip Type	Average Daily Trips*	Trip Length (mi)	Daily Emissions (lb/day)							
			NOx	CO	VOC	PM10 (exhaust)	PM10 (total)	PM2.5 (exhaust)	PM2.5 (total)	CO2
On-site Travel										
Trucks - Access Road to Quarry	66	0.16	0.35	0.84	0.08	0.00	0.01	0.00	0.01	111.15
Trucks - Quarry Travel	66	0.09	0.62	1.53	0.11	0.00	0.02	0.00	0.02	119.58
Subtotal			1.0	2.4	0.2	0.0	0.0	0.0	0.0	230.7
Off-Site Travel										
Trucks - Aggregate Haul	66	30	4.99	8.85	0.69	0.46	0.75	0.46	0.56	7295.20
Trucks - Other	18	22	1.02	1.82	0.14	0.09	0.15	0.09	0.11	1461.86
Worker Vehicles - Commute	24	22	0.68	0.08	0.01	0.02	0.05	0.02	0.03	491.94
Subtotal			5.7	8.9	0.7	0.5	0.8	0.5	0.6	7787.1
Total			**6.6**	**11.3**	**0.9**	**0.5**	**0.8**	**0.5**	**0.6**	**8017.9**

* Based on number of average daily trips in July.

			6.0	11.2	0.9		0.8		0.6	7525.9

Annual Average Emissions (tons/year)

Trip Type	Annual Trips	Trip Length (mi)	Annual Emissions (tons/year)							
			NOx	CO	VOC	PM10 (exhaust)	PM10 (total)	PM2.5 (exhaust)	PM2.5 (total)	CO2
On-site Travel										
Trucks - Access Road to Quarry	11625	0.16	0.03	0.07	0.01	0.000	0.001	0.000	0.001	9.8
Trucks - Quarry Travel	11625	0.09	0.05	0.13	0.01	0.000	0.002	0.000	0.002	10.5
Subtotal			0.1	0.2	0.0	0.000	0.003	0.000	0.003	20.3
Off-Site Travel										
Trucks - Product Pickup/Delivery	11625	30	0.44	0.8	0.06	0.04	0.07	0.04	0.05	642.5
Trucks - Other	3170	22	0.09	0.2	0.01	0.01	0.01	0.01	0.01	128.7
Worker Vehicles - Commute	4227	22	0.06	0.01	0.00	0.00	0.00	0.00	0.00	43.3
Subtotal			0.5	0.8	0.1	0.0	0.1	0.0	0.1	685.8
Total			**0.6**	**1.00**	**0.1**	**0.0**	**0.1**	**0.0**	**0.1**	**706.1**

* Based on annual production levels and truck capacities.

			0.53	0.99	0.08		0.07		0.05	662.79

Emission Factors

Vehicle Type	Travel Speed (mph)	Emission Factor Units	NOx	CO	VOC	PM10 (Exhaust)	PM10 (Total)	PM2.5 (Exhaust)	PM2.5 (Total)	CO2
Heavy-Duty Diesel Trucks	10	gram/VMT	2.65	4.745	1.216	0.076	0.14	0.076	0.097	3165.45
Heavy-Duty Diesel Trucks	55	gram/VMT	1.076	1.86	0.148	0.105	0.169	0.105	0.126	1662.35
Heavy-Duty Diesel Trucks	Idle	gram/hour	48.211	120.9	7.927	0.12	1.673	0.12	1.539	6390.88
Worker Vehicles	60	gram/VMT	0.585	0.071	0.011	0.018	0.039	0.018	0.025	422.611

Emission factors from EMFAC2007

Truck idle time (min) = 5

Harris Quarry Off-Road Equipment Exhaust Emissions
Quarry Operation at Existing Permmitted Production - 2030

Analysis Year = 2030 Existing Equipment

Item No.	Equipment Type	No. Units	Engine Age (years)	Engine Model Year	Daily Hours In Use	Days Per Year	Unit Annual Hours Use	Use Factor	Load Factor	Cumulative Hours Operation Per Unit	Engine (hp)	Level of VDECS Used	Emission Factor (g/hp-hr) NOx	CO	VOC	PM10	SO2	CO2	Daily Emissions (lb/day) NOx	CO	VOC	PM10	SO2	CO2	Annual Emissions (ton/yr) NOx	CO	VOC	PM10	SO2	CO2
Quarry Equipment																														
1	2,012 hp Generator	1	5	2025	9	140	1260	1.00	0.74	6,300	2012	3	3.75	1.19	0.20	0.015	0.006	568.3	110.9	35.2	5.8	0.4	0.17	16789	7.76	2.47	0.41	0.03	0.012	1175
2	30 hp Generator (well)	1	7	2023	4	140	560	1.00	0.74	3,920	30	0	2.97	3.80	0.26	0.01	0.007	568.3	0.6	0.7	0.1	0.0	0.00	111	0.04	0.05	0.00	0.00	0.000	8
3	22 hp Generator (scale	1	1	2029	9	140	1260	1.00	0.74	1,260	22	0	4.33	2.34	0.57	0.16	0.007	568.3	1.4	0.8	0.2	0.1	0.00	184	0.10	0.05	0.01	0.00	0.000	13
4	Cat 980C Loader	1	14	2016	8	140	1120	0.00	0.54	15,680	270	0	0.30	1.14	0.19	0.01	0.006	568.3	0.0	0.0	0.0	0.0	0.00	0	0.00	0.00	0.00	0.00	0.000	0
5	Cat 980F Loader	1	1	2029	8	140	1120	1.00	0.54	1,120	275	0	0.26	0.94	0.06	0.01	0.006	568.3	0.7	2.5	0.2	0.0	0.01	1488	0.05	0.17	0.01	0.00	0.001	104
6	Cat 980G Loader	1	16	2014	8	140	1120	1.00	0.54	17,920	300	0	0.30	1.14	0.19	0.01	0.006	568.3	0.9	3.3	0.5	0.0	0.02	1624	0.06	0.23	0.04	0.00	0.001	114
7	Cat 226B Skid Steer	1	6	2024	4	140	560	1.00	0.54	3,360	61	0	1.39	3.32	0.13	0.01	0.007	568.3	0.4	1.0	0.0	0.0	0.00	165	0.03	0.07	0.00	0.00	0.000	12
8	Cat D11R Bulldozer	1	11	2019	8	140	1120	1.00	0.64	12,320	850	0	2.58	1.14	0.19	0.03	0.006	568.3	24.7	10.9	1.8	0.3	0.05	5453	1.73	0.76	0.13	0.02	0.004	382
9	Cat 345BL Excavator	1	4	2026	8	140	1120	1.00	0.57	4,480	300	0	0.27	1.00	0.10	0.01	0.006	568.3	0.8	3.0	0.3	0.0	0.02	1714	0.06	0.21	0.02	0.00	0.001	120
	TOTAL	**-**			**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**	**-**	**-**	**-**			**140.4**	**57.4**	**9.0**	**0.9**	**0.3**	**27,527**	**9.83**	**4.02**	**0.63**	**0.06**	**0.019**	**1,927**
	***** Tier 1 engine (~1978), Rebuilt in 2005																		**Quarry equipment without generators -->**	**27.5**	**20.6**	**2.9**	**0.35**	**0.1**	**10444**	**1.92**	**1.44**	**0.20**	**0.025**	**0.01**	**731**

Emission Factors - Off-Road Compression Ignited Engines

Item No.	EF ID	NOx ZH EF (g/hp-hr)	NOx DR (g/hp-hr^2)	NOx Fuel CF	CO ZH EF (g/hp-hr)	CO DR (g/hp-hr^2)	CO Fuel CF	ROG ZH EF (g/hp-hr)	ROG DR (g/hp-hr^2)	ROG Fuel CF	PM10 ZH EF (g/hp-hr)	PM10 DR (g/hp-hr^2)	PM10 Fuel CF	CO2 ZH EF (g/hp-hr)	CO2 DR (g/hp-hr^2)	CO2 Fuel CF	SO2 (g/hp-hr)
1	ULSD99992025	2.36	3.00E-05	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.02	1.00E-06	0.85	568.30	0.00E+00	1.00	0.006
2	ULSD502023	2.90	6.00E-05	0.95	2.72	2.76E-04	1.00	0.10	4.00E-05	1.00	0.01	1.20E-06	0.85	568.30	0.00E+00	1.00	0.007
3	ULSD252029	4.57	0.00E+00	0.95	2.34	0.00E+00	1.00	0.57	0.00E+00	1.00	0.19	0.00E+00	0.85	568.30	0.00E+00	1.00	0.007
4	ULSD5002016	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
5	ULSD5002029	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
6	ULSD5002014	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
7	ULSD1202024	1.40	1.88E-05	0.95	3.05	8.10E-05	1.00	0.07	1.74E-05	1.00	0.01	1.04E-06	0.85	568.30	0.00E+00	1.00	0.007
8	ULSD10002019	2.36	3.00E-05	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.02	1.00E-06	0.85	568.30	0.00E+00	1.00	0.006
9	ULSD5002026	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006

Notes: ZH EF = Zero hour emission factor
DR = Deterioration rate
ULSD = Ultra low sulfur diesel (15 ppmw sulfur, 0.0015% sulfur)

Refs: CARB OFFFROAD2007 model (http://www.arb.ca.gov/msei/offroad/offroad.htm), December, 2006.
Stationary/Off-road engines ARB, "California's Emissions Inventory for Off-Road Large Compressio-Ignited (CI) Engines (> 25 HP)" MAC#99-32

Proposed Harris Quarry - Daily and Annual Emissions From Vehicle Travel - 2010
Daily and Annual Emissions From Vehicle Travel

Average Daily Emissions

Trip Type	Average Daily Trips*	Trip Length (mi)	Average Daily Emissions (lb/day) NOx	CO	VOC	PM10 (exhaust)	PM10 (total)	PM2.5 (exhaust)	PM2.5 (total)	CO2
On-site Travel										
Trucks - Access Road to Quarry	162	0.16	3.10	1.30	0.41	0.09	0.09	0.08	0.08	272.82
Trucks - Quarry Travel	196	0.09	5.17	2.22	0.53	0.11	0.11	0.10	0.10	355.12
Trucks - Quarry to Asphalt Plant	52	0.58	2.72	1.13	0.40	0.09	0.10	0.08	0.08	270.85
Trucks - Off-site to Asphalt Plant	52	0.23	1.20	0.50	0.17	0.04	0.04	0.03	0.03	114.55
Subtotal			12.2	5.2	1.5	0.3	0.3	0.3	0.3	1013.3
Off-Site Travel										
Trucks - Aggregate	122	30	105.66	19.16	4.66	3.39	3.91	3.12	3.29	13485.06
Trucks - Asphalt	52	30	45.03	8.17	1.98	1.45	1.67	1.33	1.40	5747.73
Turcks - Transfer to Willits	22	6	4.00	0.77	0.18	0.13	0.14	0.12	0.12	496.68
Trucks - Other	18	22	11.48	2.10	0.51	0.37	0.42	0.34	0.36	1461.86
Worker Vehicles - Commute	33	22	1.33	7.05	0.27	0.03	0.07	0.03	0.04	674.09
Subtotal			167.5	37.2	7.6	5.4	6.2	4.9	5.2	21865.4
Total			**179.7**	**42.4**	**9.1**	**5.7**	**6.5**	**5.2**	**5.5**	**22878.8**

* Based on number of average daily trips in July.

		178.4	35.3	8.8		6.5		5.5	22204.7

Annual Average Emissions (tons/year)

Trip Type	Annual Trips	Trip Length (mi)	Annual Emissions (tons/year) NOx	CO	VOC	PM10 (exhaust)	PM10 (total)	PM2.5 (exhaust)	PM2.5 (total)	CO2
On-site Travel										
Trucks - Off-site to Quarry	28,865	0.16	0.28	0.12	0.04	0.008	0.008	0.007	0.007	24.31
Trucks - Quarry Travel	31,320	0.09	0.41	0.18	0.04	0.008	0.009	0.008	0.008	28.37
Trucks - Quarry to Asphalt Plant	7,285	0.58	0.19	0.08	0.03	0.006	0.007	0.006	0.006	18.97
Trucks - Off-site to Asphalt Plant	7,285	0.42	0.12	0.05	0.02	0.004	0.005	0.004	0.004	12.84
Subtotal			1.0	0.4	0.1	0.027	0.028	0.024	0.025	84.5
Off-Site Travel										
Trucks - Aggregate	20,315	30	8.80	1.6	0.39	0.282	0.33	0.26	0.27	1122.74
Trucks - Asphalt	7,285	30	3.15	0.6	0.14	0.101	0.12	0.09	0.10	402.62
Trucks - Transfer to Willits	3,720	6	0.34	0.1	0.02	0.011	0.01	0.01	0.01	41.99
Trucks - Other	4,830	22	1.54	0.3	0.07	0.049	0.06	0.05	0.05	196.12
Worker Vehicles - Commute	5,574	22	0.11	0.60	0.02	0.003	0.01	0.00	0.00	56.93
Subtotal			13.9	3.1	0.6	0.446	0.5	0.4	0.4	1820.4
Total			**14.9**	**3.53**	**0.8**	**0.5**	**0.5**	**0.4**	**0.5**	**1905**

* Based on annual production levels and truck capacities.

		14.8	2.9	0.7		0.5		0.5	1848.0

Emission Factors

Vehicle Type	Travel Speed (mph)	Emission Factor Units	NOx	CO	VOC	PM10 (Exhaust)	PM10 (Total)	PM2.5 (Exhaust)	PM2.5 (Total)	CO2
Heavy-Duty Diesel Trucks (HHD)	10	gram/VMT	24.244	9.665	4.745	1.157	1.221	1.003	1.024	3165.45
Heavy-Duty Diesel Trucks (HHD)	55	gram/VMT	12.932	2.303	0.564	0.418	0.482	0.385	0.406	1662.35
Heavy-Duty Diesel Trucks (HHD)	Idle	gram/hour	117.002	51.181	9.432	1.673	1.673	1.539	1.539	6390.88
Worker Vehicles (LDT2)	60	gram/VMT	0.83	4.404	0.168	0.02	0.041	0.018	0.025	421.156

Emission factors from EMFAC2007

Truck idle time (min) = 5

Harris Quarry Off-Road Equipment Exhaust Emissions
Proposed Quarry Operation at Increased Production Levels- 2010

Analysis Year = 2010 Existing Equipment

Item No.	Equipment Type	No. Units	Engine Age (years)	Engine Model Year	Daily Hours In Use	Days Per Year	Unit Annual Hours Use	Use Factor	Load Factor	Cumulative Hours Operation Per Unit	Engine (hp)	Level of VDECS Used	Emission Factor (g/hp-hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
													NOx	CO	VOC	PM10	SO2	CO2	NOx	CO	VOC	PM10	SO2	CO2	NOx	CO	VOC	PM10	SO2	CO2
Quarry Equipment																														
1	2,012 hp Generator	1	3	2007	9	170	1530	1.00	0.74	4,590	2012	3	3.75	1.19	0.20	0.015	0.006	568.3	110.9	35.2	5.8	0.4	0.17	16789	9.43	3.00	0.50	0.04	0.014	1427
2	30 hp Generator (well)	1	5	2005	4	170	680	1.00	0.74	7,650	30	0	5.39	5.33	0.90	0.48	0.007	568.3	1.1	1.0	0.2	0.1	0.00	111	0.09	0.09	0.01	0.01	0.000	9
3	22 hp Generator (scale	1	18	1992	9	170	1530	1.00	0.74	27,540	22	0	6.44	5.00	1.84	0.55	0.007	568.3	2.1	1.6	0.6	0.2	0.00	184	0.18	0.14	0.05	0.02	0.000	16
4	Cat 980C Loader	1	12	1998	8	170	1360	0.00	0.54	21,000	270	0	7.11	1.14	0.45	0.20	0.006	568.3	0.0	0.0	0.0	0.0	0.00	0	0.00	0.00	0.00	0.00	0.000	0
5	Cat 980F Loader	1	17	1993	8	170	1360	1.00	0.54	26,500	275	0	9.12	3.34	0.96	0.45	0.006	568.3	23.9	8.8	2.5	1.2	0.01	1488	2.03	0.74	0.21	0.10	0.001	127
6	Cat 980G Loader	1	14	1996	8	170	1360	1.00	0.54	25,900	300	0	7.11	1.14	0.45	0.20	0.006	568.3	20.3	3.3	1.3	0.6	0.02	1624	1.73	0.28	0.11	0.05	0.001	138
7	Cat 226B Skid Steer	1	4	2006	4	170	680	1.00	0.54	2,720	61	0	4.94	3.31	0.26	0.23	0.007	568.3	1.4	1.0	0.1	0.1	0.00	165	0.12	0.08	0.01	0.01	0.000	14
8	Cat D11R Bulldozer	1	7	2003	8	170	1360	1.00	0.64	15,800	850	0	7.11	1.14	0.45	0.20	0.006	568.3	68.2	10.9	4.4	1.9	0.05	5453	5.80	0.93	0.37	0.16	0.005	463
9	Cat 345BL Excavator	1	2	2008	8	170	1360	1.00	0.57	2,720	300	0	2.40	0.97	0.17	0.10	0.006	568.3	7.3	2.9	0.5	0.3	0.02	1714	0.62	0.25	0.04	0.03	0.001	146
	Subtotal																		**235.1**	**64.7**	**15.4**	**4.7**	**0.28**	**27527**	**19.99**	**5.50**	**1.31**	**0.40**	**0.024**	**2340**
Asphalt Plant Equipment																														
10	Cat 966H Loader - A	1	1	2009	8	140	1120	1.00	0.54	1,120	262	0	2.36	0.94	0.13	0.09	0.006	568.3	5.9	2.3	0.3	0.2	0.01	1418	0.41	0.16	0.02	0.02	0.001	99
	Subtotal																		**5.9**	**2.3**	**0.3**	**0.2**	**0.01**	**1418**	**0.41**	**0.16**	**0.02**	**0.0162**	**0.001**	**99**
	TOTAL	**-**			**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**	**-**	**-**	**-**			**241.0**	**67.1**	**15.7**	**4.9**	**0.3**	**28,945**	**20.40**	**5.67**	**1.33**	**0.42**	**0.024**	**2,439**
	Quarry equipment without generators -->																		**121.1**	**26.81**	**8.77**	**3.99**	**0.10**	**10444**	**10.29**	**2.28**	**0.75**	**0.3390**	**0.01**	**888**

***** Tier 1 engine (~1978), Rebuilt in 2005

Emission Factors - Off-Road Compression Ignited Engines

Item No.	EF ID	NOx ZH EF (g/hp-hr)	NOx DR (g/hp-hr^2)	NOx Fuel CF	CO ZH EF (g/hp-hr)	CO DR (g/hp-hr^2)	CO Fuel CF	ROG ZH EF (g/hp-hr)	ROG DR (g/hp-hr^2)	ROG Fuel CF	PM10 ZH EF (g/hp-hr)	PM10 DR (g/hp-hr^2)	PM10 Fuel CF	CO2 ZH EF (g/hp-hr)	CO2 DR (g/hp-hr^2)	CO2 Fuel CF	SO2 (g/hp-hr)
1	ULSD99992007	4.51	6.32E-05	0.95	0.92	1.82E-05	1.00	0.14	2.22E-05	1.00	0.11	6.03E-06	0.80	568.30	0.00E+00	1.00	0.006
2	ULSD502005	4.95	9.67E-05	0.95	3.00	3.05E-04	1.00	0.37	6.90E-05	1.00	0.38	2.93E-05	0.80	568.30	0.00E+00	1.00	0.007
3	ULSD251992	6.92	0.00E+00	0.93	5.00	0.00E+00	1.00	1.84	0.00E+00	1.00	0.76	0.00E+00	0.72	568.30	0.00E+00	1.00	0.007
4	ULSD5001998	6.25	1.04E-04	0.95	0.92	1.82E-05	1.00	0.32	1.12E-05	1.00	0.15	7.96E-06	0.80	568.30	0.00E+00	1.00	0.006
5	ULSD5001993	8.17	1.36E-04	0.93	2.70	5.35E-05	1.00	0.68	2.37E-05	1.00	0.38	2.02E-05	0.72	568.30	0.00E+00	1.00	0.006
6	ULSD5001996	6.25	1.04E-04	0.95	0.92	1.82E-05	1.00	0.32	1.12E-05	1.00	0.15	7.96E-06	0.80	568.30	0.00E+00	1.00	0.006
7	ULSD1202006	5.01	7.45E-05	0.95	3.09	8.21E-05	1.00	0.19	2.71E-05	1.00	0.24	1.76E-05	0.80	568.30	0.00E+00	1.00	0.007
8	ULSD10002003	6.25	1.04E-04	0.95	0.92	1.82E-05	1.00	0.32	1.12E-05	1.00	0.15	7.96E-06	0.80	568.30	0.00E+00	1.00	0.006
9	ULSD5002008	2.45	3.18E-05	0.95	0.92	1.82E-05	1.00	0.10	2.50E-05	1.00	0.11	5.55E-06	0.80	568.30	0.00E+00	1.00	0.006
10	ULSD5002009	2.45	3.18E-05	0.95	0.92	1.82E-05	1.00	0.10	2.50E-05	1.00	0.11	5.55E-06	0.80	568.30	0.00E+00	1.00	0.006

Notes ZH EF = Zero hour emission factor
DR = Deterioration rate
ULSD = Ultra low sulfur diesel (15 ppmw sulfur, 0.0015% sulfur)

Refs: CARB OFFFROAD2007 model (http://www.arb.ca.gov/msei/offroad/offroad.htm), December, 2006.
Stationary/Off-road engines ARB, "California's Emissions Inventory for Off-Road Large Compressio-Ignited (CI) Engines (> 25 HP)" MAC#99-32

Proposed Harris Quarry
Fugitive Dust Paved Road Emissions
Proposed Project - 2010 & 2030

Emission Factor (1)

$E = k * (sL/2)^{0.65} * (W/3)^{1.5}$ [maximum hour]

$E = k * (sL/2)^{0.65} * (W/3)^{1.5} * (1 - P/4N)$ [average day]

E (PM10)	PM10 emission factor (uncontrolled)	0.275	lb/VMT
E (PM2.5	PM2.5 emission factor (uncontrolled)	0.041	lb/VMT
k (PM10)	PM10 particle size multiplier	0.016	
k (PM2.5)	PM2.5 particle size multiplier	0.0024	
sL (2)	silt loading	1	g/m^2
W	weight (empty)	14	tons
	weight (loaded)	40	tons
	weight (mean)	27	tons
P	days of rainfall > 0.01 in	94	days
N	days in period	365	days

Aggregate to Off-Site Sales	PM10	PM2.5
Daily Emissions		
trips/day (one way)	162	162
ft/trip (internal haul road to highway)	830	830
mi/trip	0.16	0.16
VMT/day	25.5	25.5
operation (hr/day)	9	9
control efficiency for vacuum sweepers	90%	90%
lb/day	0.701	0.105
Annual Average Emissions		
trips/yr (one way)	27,540	27,540
ft/trip (entrance to quarry)	830	830
mi/trip	0.157	0.157
VMT/yr	4,324	4,324
lb/yr	111.4	16.7
ton/yr	0.06	0.01

Aggregate to Asphalt Plant	PM10	PM2.5
Daily Emissions		
trips/day (one way)	52	52
ft/trip (internal haul road to Quarry to Asphalt Plant)	3,645	3,645
mi/trip	0.69	0.69

Asphalt to Off-Site Sales	PM10	PM2.5
Daily Emissions		
trips/hr (one way)	52	52
trips/day (one way)	3,645	3,645
mi/trip	0.69	0.69
VMT/day	35.9	35.9
control efficiency for vacuum sweepers	90%	90%
lb/day	0.99	0.15
Annual Average Emissions		
trips/yr (one way)	7,280	7,280
ft/trip (entrance to quarry)	1,815	1,815
mi/trip	0.344	0.344
VMT/yr	2,504	2,504
lb/yr	64.5	9.7
ton/yr	0.032	0.005
Total		
lb/day	2.68	0.4
ton/yr	0.1	0.02

Notes:

1. Emission factors from AP-42, Section 13.2.1 (Paved Roads).
2. Silt loading from Section 13.2.1, Table 13.2.1-3.
3. Roads would be swept with PM10-efficient sweepers to reduce dust. According to Mark Kinter, Technical Consultant to Elgin Sweeper Company, sweepers complying with South Coast AQMD Rule 1186 have control efficiencies in the high 90s. A value of 90% was used in these calculations.

Proposed Harris Quarry - Daily and Annual Emissions From Vehicle Travel - 2030
Daily and Annual Emissions From Vehicle Travel

Average Daily Emissions

Trip Type	Average Daily Trips*	Trip Length (mi)	Average Daily Emissions (lb/day)							
						PM10		PM2.5		
			NOx	CO	VOC	(exhaust)	(total)	(exhaust)	(total)	CO2
On-site Travel										
Trucks - Access Road to Quarry	162	0.16	2.07	0.87	0.19	0.01	0.03	0.01	0.03	272.82
Trucks - Quarry Travel	196	0.091	4.54	1.84	0.33	0.01	0.07	0.01	0.06	355.12
Trucks - Quarry to Asphalt Plant	52	0.58	1.47	0.64	0.16	0.01	0.03	0.01	0.02	270.85
Trucks - Off-site to Asphalt Plant	52	0.23	0.70	0.30	0.07	0.00	0.01	0.00	0.01	114.55
Subtotal			8.8	3.6	0.7	0.0	0.1	0.0	0.1	1013.3
Off-Site Travel										
Trucks - Aggregate	122	30	16.36	9.22	1.28	0.85	1.38	0.85	1.03	13485.06
Trucks - Asphalt	52	30	6.97	3.93	0.55	0.36	0.59	0.36	0.44	5747.73
Turcks - Transfer to Willits	22	6	0.79	0.41	0.06	0.03	0.05	0.03	0.04	496.68
Trucks - Other	18	22	1.82	1.02	0.14	0.09	0.15	0.09	0.11	1461.86
Worker Vehicles - Commute	33	22	0.11	0.94	0.18	0.03	0.06	0.03	0.04	676.42
Subtotal			26.1	15.5	2.2	1.4	2.2	1.4	1.7	21867.7
Total			**34.8**	**19.2**	**3.0**	**1.4**	**2.4**	**1.4**	**1.8**	**22881.1**

* Based on number of average daily trips in July.

	34.7	18.2	2.8		2.3		1.7	22204.7

Annual Average Emissions (tons/year)

Trip Type	Annual Trips	Trip Length (mi)	Annual Emissions (tons/year)							
						PM10		PM2.5		
			NOx	CO	VOC	(exhaust)	(total)	(exhaust)	(total)	CO2
On-site Travel										
Trucks - Off-site to Quarry	28,865	0.16	0.18	0.08	0.02	0.001	0.003	0.001	0.003	24.31
Trucks - Quarry Travel	31,320	0.09	0.36	0.15	0.03	0.001	0.005	0.001	0.005	28.37
Trucks - Quarry to Asphalt Plant	7,285	0.58	0.10	0.04	0.01	0.000	0.002	0.000	0.001	18.97
Trucks - Off-site to Asphalt Plant	7,285	0.42	0.06	0.03	0.01	0.000	0.001	0.000	0.001	12.84
Subtotal			0.7	0.3	0.1	0.002	0.011	0.002	0.010	84.5
Off-Site Travel										
Trucks - Aggregate	20,315	30	1.36	0.8	0.11	0.071	0.12	0.07	0.09	1122.74
Trucks - Asphalt	7,285	30	0.49	0.3	0.04	0.025	0.04	0.03	0.03	402.62
Trucks - Transfer to Willits	3,720	6	0.07	0.0	0.00	0.003	0.00	0.00	0.00	41.99
Trucks - Other	4,830	22	0.24	0.1	0.02	0.012	0.02	0.01	0.02	196.12
Worker Vehicles - Commute	5,574	22	0.01	0.08	0.01	0.002	0.01	0.00	0.00	57.13
Subtotal			2.2	1.3	0.2	0.113	0.2	0.1	0.1	1820.6
Total			**2.9**	**1.59**	**0.2**	**0.1**	**0.2**	**0.1**	**0.1**	**1905**

* Based on annual production levels and truck capacities.

	2.87	1.51	0.23		0.19		0.14	1847.96

Emission Factors

Vehicle Type	Travel Speed (mph)	Emission Factor Units	NOx	CO	VOC	PM10 (Exhaust)	PM10 (Total)	PM2.5 (Exhaust)	PM2.5 (Total)	CO2
Heavy-Duty Diesel Trucks (HHD)	10	gram/VMT	4.745	2.65	1.216	0.076	0.14	0.076	0.097	3165.45
Heavy-Duty Diesel Trucks (HHD)	55	gram/VMT	1.86	1.076	0.148	0.105	0.169	0.105	0.126	1662.35
Heavy-Duty Diesel Trucks (HHD)	Idle	gram/hour	120.9	48.211	7.927	0.12	1.673	0.12	1.539	6390.88
Worker Vehicles (LDT2)	60	gram/VMT	0.071	0.585	0.11	0.018	0.039	0.018	0.025	422.611

Emission factors from EMFAC2007

Truck idle time (min) = 5

Harris Quarry Off-Road Equipment Exhaust Emissions
Proposed Quarry Operation at Increased Production Levels- 2030

Analysis Year = 2030 Existing Equipment

Item No.	Equipment Type	No. Units	Engine Age (years)	Engine Model Year	Daily Hours In Use	Days Per Year	Unit Annual Hours Use	Use Factor	Load Factor	Cumulative Hours Operation Per Unit	Engine (hp)	Level of VDECS Used	Emission Factor (g/hp-hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
													NOx	CO	VOC	PM10	SO2	CO2	NOx	CO	VOC	PM10	SO2	CO2	NOx	CO	VOC	PM10	SO2	CO2
Quarry Equipment																														
1	2,012 hp Generator	1	5	2025	9	170	1530	1.00	0.74	7,650	2012	3	3.75	1.19	0.20	0.015	0.006	568.3	110.9	35.2	5.8	0.4	0.17	16789	9.43	3.00	0.50	0.04	0.014	1427
2	30 hp Generator (well)	1	7	2023	4	170	680	1.00	0.74	4,760	30	0	3.02	4.03	0.29	0.01	0.007	568.3	0.6	0.8	0.1	0.0	0.00	111	0.05	0.07	0.00	0.00	0.000	9
3	22 hp Generator (scale)	1	1	2029	9	170	1530	1.00	0.74	1,530	22	0	4.33	2.34	0.57	0.16	0.007	568.3	1.4	0.8	0.2	0.1	0.00	184	0.12	0.06	0.02	0.00	0.000	16
4	Cat 980C Loader	1	14	2016	8	170	1360	0.00	0.54	19,040	270	0	0.30	1.14	0.19	0.01	0.006	568.3	0.0	0.0	0.0	0.0	0.00	0	0.00	0.00	0.00	0.00	0.000	0
5	Cat 980F Loader	1	1	2029	8	170	1360	1.00	0.54	1,360	275	0	0.26	0.94	0.07	0.01	0.006	568.3	0.7	2.5	0.2	0.0	0.01	1488	0.06	0.21	0.01	0.00	0.001	127
6	Cat 980G Loader	1	16	2014	8	170	1360	1.00	0.54	21,760	300	0	0.30	1.14	0.19	0.01	0.006	568.3	0.9	3.3	0.5	0.0	0.02	1624	0.07	0.28	0.05	0.00	0.001	138
7	Cat 226B Skid Steer	1	6	2024	4	170	680	1.00	0.54	4,080	61	0	1.40	3.38	0.14	0.01	0.007	568.3	0.4	1.0	0.0	0.0	0.00	165	0.03	0.08	0.00	0.00	0.000	14
8	Cat D11R Bulldozer	1	11	2019	8	170	1360	1.00	0.64	14,960	850	0	2.58	1.14	0.19	0.03	0.006	568.3	24.7	10.9	1.8	0.3	0.05	5453	2.10	0.93	0.16	0.02	0.005	463
9	Cat 345BL Excavator	1	4	2026	8	170	1360	1.00	0.57	5,440	300	0	0.28	1.02	0.11	0.01	0.006	568.3	0.8	3.1	0.3	0.0	0.02	1714	0.07	0.26	0.03	0.00	0.001	146
	Subtotal																		**140.4**	**57.5**	**9.0**	**0.9**	**0.28**	**27527**	**11.94**	**4.89**	**0.77**	**0.07**	**0.024**	**2340**
Asphalt Plant Equipment																														
10	Cat 966H Loader - A	1	1	2027	8	140	1120	1.00	0.54	3,360	262	0	0.27	0.98	0.09	0.01	0.006	568.3	0.7	2.4	0.2	0.0	0.01	1418	0.05	0.17	0.02	0.00	0.001	99
	Subtotal																		**0.7**	**2.4**	**0.2**	**0.0**	**0.01**	**1418**	**0.05**	**0.17**	**0.02**	**0.0017**	**0.001**	**99**
	TOTAL	-			-	-	-	-	-	-	-		-	-	-	-			**141.1**	**59.9**	**9.2**	**0.9**	**0.3**	**28,945**	**11.98**	**5.06**	**0.78**	**0.07**	**0.024**	**2,439**
	Quarry equipment without generators -->																		**27.5**	**20.70**	**2.93**	**0.35**	**0.10**	**10444**	**2.34**	**1.76**	**0.25**	**0.0302**	**0.01**	**888**

***** Tier 1 engine (~1978), Rebuilt in 2005

Emission Factors - Off-Road Compression Ignited Engines

Item No.	EF ID	NOx ZH EF (g/hp-hr)	NOx DR (g/hp-hr^2)	NOx Fuel CF	CO ZH EF (g/hp-hr)	CO DR (g/hp-hr^2)	CO Fuel CF	ROG ZH EF (g/hp-hr)	ROG DR (g/hp-hr^2)	ROG Fuel CF	PM10 ZH EF (g/hp-hr)	PM10 DR (g/hp-hr^2)	PM10 Fuel CF	CO2 ZH EF (g/hp-hr)	CO2 DR (g/hp-hr^2)	CO2 Fuel CF	SO2 (g/hp-hr)
1	ULSD99992025	2.36	3.00E-05	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.02	1.00E-06	0.85	568.30	0.00E+00	1.00	0.006
2	ULSD502023	2.90	6.00E-05	0.95	2.72	2.76E-04	1.00	0.10	4.00E-05	1.00	0.01	1.20E-06	0.85	568.30	0.00E+00	1.00	0.007
3	ULSD252029	4.57	0.00E+00	0.95	2.34	0.00E+00	1.00	0.57	0.00E+00	1.00	0.19	0.00E+00	0.85	568.30	0.00E+00	1.00	0.007
4	ULSD5002016	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
5	ULSD5002029	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
6	ULSD5002014	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
7	ULSD1202024	1.40	1.88E-05	0.95	3.05	8.10E-05	1.00	0.07	1.74E-05	1.00	0.01	1.04E-06	0.85	568.30	0.00E+00	1.00	0.007
8	ULSD10002019	2.36	3.00E-05	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.02	1.00E-06	0.85	568.30	0.00E+00	1.00	0.006
9	ULSD5002026	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
10	ULSD5002027	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006

Notes ZH EF = Zero hour emission factor
DR = Deterioration rate
ULSD = Ultra low sulfur diesel (15 ppmw sulfur, 0.0015% sulfur)

Refs: CARB OFFFROAD2007 model (http://www.arb.ca.gov/msei/offroad/offroad.htm), December, 2006.
Stationary/Off-road engines ARB, "California's Emissions Inventory for Off-Road Large Compressio-Ignited (CI) Engines (> 25 HP)" MAC#99-32

Northern Aggregates
Asphalt Plant Emissions Year 2010 & 2030

Process Rates	Asphalt Concrete		Sand/Aggregate	
Maximum Hourly	300	ton/hr	285	ton/hr
Maximum Daily	3000	ton/day	2850	ton/day
Average Daily	700	ton/day	665	ton/day
Annual Average	150,000	ton/yr	142,500	ton/yr

		Washed Sand	Unwashed Sand	Coarse Aggregate
Maximum Hourly	ton/hr	95.0	95.0	95.0
Maximum Daily	ton/day	950.0	950.0	950.0
Annual Average	ton/yr	47,500	47,500	47,500

Based on Tons of Material Processed

		PM10 Emissions						PM2.5 Emissions					
		Emission Factor	Max Hourly	Max Daily	Ave Daily	Annual Average		Emission Factor	Max Hourly	Max Daily	Ave Daily	Maximum Annual	
Source	Controlled?	(lb/ton)	(lb/hr)	(lb/day)	(lb/day)	(lb/yr)	(ton/yr)	(lb/ton)	(lb/hr)	(lb/day)	(lb/day)	(lb/yr)	(ton/yr)
Fugitive Sources													
Aggregate delivery to ground storage	No	0.00029	0.028	0.276	0.064	13.8	0.007	0.00004	0.004	0.041	0.010	2.1	0.001
Sand delivery to ground storage	No	0.00015	0.029	0.285	0.067	14.3	0.007	0.00002	0.004	0.043	0.010	2.1	0.001
Aggregate transfer to conveyor	No	0.00029	0.028	0.276	0.064	13.8	0.007	0.00004	0.004	0.041	0.010	2.1	0.001
Sand transfer to conveyor	No	0.00015	0.029	0.285	0.067	14.3	0.007	0.00002	0.004	0.043	0.010	2.1	0.001
Total - Fugitive Sources			0.11	1.12	0.26	56.05	0.03		0.017	0.168	0.039	8.4	0.004

Notes:
1. Emission calculations based on AP-42 Sections 11.12 and 13.2.4.
2. Asphalt mix is assumed to be 95% sand/aggregate, with washed sand, unwashed sand, and coarse aggregate each being one-third.

Emission Factors

		Loading/Transfer Emission Factors	
		PM10	PM2.5
Aggregate	k	0.35	0.053
	U (mph)	4.7	4.7
	M (%)	5	5
	E	0.00029	0.00004
Sand	k	0.35	0.053
	U (mph)	4.7	4.7
	M (%)	8	8
	E	0.00015	0.00002

Notes:
1. AP-42 emission factors from Section 13.2.4 - Aggregate Handling and Storage Piles.
2 Wind speed is mean wind speed from Willits meteorological data set.

Northern Aggregates
Asphalt Dryer Emissions - Year 2010 & 2030

Operating Parameters

300	ton/hr	Maximum Hourly
3000	ton/day	Maximum Daily
700	ton/day	Average Daily
150,000	ton/yr	Annual Average
547.40	gal/hr	No. 2 diesel
273700	gal/year	No. 2 diesel

Pollutant	Emission Factor (1) (lb/ton)	Maximum Hourly (lbs/hr)	Maximum Daily (lbs/day)	Average Daily (lbs/day)	Maximum Annual (lbs/year)	Maximum Annual (ton/year)
PM10 (2)	0.0042	1.3	12.6	16.1	630	0.32
PM2.5 (2)	0.0029	0.9	8.7	15.4	435	0.218
PM10-burner (3)	1.08 lb/1000 Gal	0.59	5.9	1.4	296	0.148
PM2.5-burner (3)	0.83 lb/1000 Gal	0.45	4.5	1.1	227	0.114
CO	0.13	39.0	390.0	91.0	19,500	9.75
NOx	0.055	16.5	165.0	38.5	8,250	4.13
VOC	0.032	9.6	96.0	22.4	4,800	2.40
CO2	33	9,900	99,000	23,100	4,950,000	2,475

Notes:

(1) AP-42, Section 11.1, Table 11.1-3 & 11.1-4 (PM10,PM2.5),Table 11.1-7 (CO,NOx, CO2), and Table 11.1-8 (VOC).

(2) Emissions controlled using a baghouse with 99.9% collection efficiency

(3) AP-42, Section 1.3. Table 1.3-7 for PM10 and PM2.5 from burners (assumes no control).

Northern Aggregates
Hot Oil Heater Emissions - Year 2010 & 2030

Burner Information		
1.2	MMBtu/hr	
8.76	gal/hr	No. 2 diesel
76730	gal/year	No. 2 diesel

Pollutant	Emission Factor (1) (lb/1000 gal)	Maximum Hourly (lbs/hr)	Maximum Daily (2) (lbs/day)	Maximum Annual (lbs/year)	Maximum Annual (ton/year)
PM10	1.08	0.01	0.2	83	0.04
PM2.5	0.83	0.01	0.2	64	0.03
CO	1.2	0.01	0.3	92	0.05
NOx	20	0.18	4.2	1,535	0.77
VOC(3)	0.56	0.005	0.1	43	0.02
CO2	28000	245	5,886	2,148,438	1,074

Notes:

(1) AP-42, Section 1.3. Table 1.3-5 (NOx, TOC), Table 1.3-7 (PM10 & PM2.5),

, Table 13-3 (TOC), and Section 11.1, Table 11.1-1 (CO, CO2)

(2) Heater assumed to operate 24 hours per day

(3) All TOC assumed to be VOC

Northern Aggregates
Asphalt Silo Filling Emissions - Year 2010 & 2030

Operating Parameters

300	ton/hr	Maximum Hourly
3000	ton/day	Maximum Daily
	ton/day	Average Daily
150,000	ton/yr	Annual Average

EF (Organic PM)=	0.00105(-V) e^((0.0251)*(T+460)-20.43)	(Ref: Table 11.1-14)
EF (Total PM)=	0.000332 + 0.00105(-V) e^((0.0251)*(T+460)-20.43)	(Ref: Table 11.1-14)
EF (CO)=	0.00488(-V) e^((0.0251)*(T+460)-20.43)	(Ref: Table 11.1-14)
EF (TOC)=	0.0504(-V) e^((0.0251)*(T+460)-20.43)	(Ref: Table 11.1-14)

V	-0.5	(Ref: Table 11.1-14)
T	325 F	(Ref: Table 11.1-14)

Control Efficiency	99.9%

EF (Organic PM)	2.54E-04
EF (Total PM)	5.86E-04
EF (CO)	1.18E-03
EF (TOC)	1.22E-02

Pollutant	Uncontrolled Emission Factor (2)	Controlled Emission Factor	Maximum Hourly (lbs/hr)	Maximum Daily (lbs/day)	Average Daily (lbs/day)	Maximum Annual (lbs/year)	Maximum Annual (ton/year)
PM10	5.86E-04	5.86E-07	0.00018	0.0018	0.0004	0.088	0.00004
PM2.5	5.86E-04	5.86E-07	0.00018	0.0018	0.0004	0.09	0.00004
TOC (VOC)	1.22E-02	1.22E-02	3.65601	36.5601	8.5307	1828.00	0.914
CO	1.18E-03	1.18E-03	0.354	3.540	0.826	177.0	0.088

Notes:
(1) AP-42, Section 11.1, Table 11.1-14.
(2) Overall control efficiency for PM10 & PM2.5 is assumed to be 99.9% control.
No control of CO or TOC is assumed.

Northern Aggregates
Truck Load-Out Emissions - Year 2010 & 2030

Operating Parameters

300	ton/hr	Maximum Hourly
3000	ton/day	Maximum Daily
700	ton/day	Average Daily
150,000	ton/yr	Annual Average

EF (Organic PM)=	0.00141(-V) e^((0.0251)*(T+460)-20.43)	(Ref: Table 11.1-14)
EF (Total PM) =	0.000181 + 0.00141(-V) e^((0.0251)*(T+460)-20.43)	(Ref: Table 11.1-14)
EF (CO)=	0.00558(-V) e^((0.0251)*(T+460)-20.43)	(Ref: Table 11.1-14)
EF (TOC)=	0.0172(-V) e^((0.0251)*(T+460)-20.43)	(Ref: Table 11.1-14)

V	-0.5	(Ref: Table 11.1-14)
T	325 F	(Ref: Table 11.1-14)

Capture Efficiency	70%
Control Efficiency	95%
Overall Control Efficiency	67%

EF (Organic PM)	3.41E-04
EF (Total PM)	1.53E-03
EF (CO)	1.35E-03
EF (TOC)	4.16E-03

Pollutant	Uncontrolled Emission Factor (1)	Controlled Emission Factor	Maximum Hourly (lbs/hr)	Maximum Daily (lbs/day)	Average Daily (lbs/day)	Maximum Annual (lbs/year)	Maximum Annual (ton/year)
PM10	1.53E-03	5.13E-04	0.154	1.538	0.359	76.9	0.038
PM2.5	1.53E-03	5.13E-04	0.154	1.538	0.359	76.9	0.038
TOC (VOC)	4.16E-03	4.16E-03	1.248	12.477	2.911	623.8	0.312
CO	1.35E-03	1.35E-03	0.405	4.048	0.944	202.4	0.101

Notes:
(1) AP-42, Section 11.1, Table 11.1-14.
(2) Overall control efficiency of 67% for PM10 & PM2.5 is assumed to be 70% capture and 95% control.
No control of CO or TOC is assumed.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Asphalt Tank 1
City:	Willits
State:	California
Company:	Northern Aggregates
Type of Tank:	Vertical Fixed Roof Tank
Description:	30,000 gal 10.5 x 48 Asphalt Oil Tank

Tank Dimensions

Shell Height (ft):		48.00
Diameter (ft):		10.50
Liquid Height (ft) :		45.00
Avg. Liquid Height (ft):		40.00
Volume (gallons):		29,148.36
Turnovers:		21.67
Net Throughput(gal/yr):		650,000.00
Is Tank Heated (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		2.00
Slope (ft/ft) (Cone Roof)		0.38

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Sacramento, California (Avg Atmospheric Pressure = 14.72 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Asphalt Tank 1 - Vertical Fixed Roof Tank
Willits, California

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Asphalt Oil	All	300.00	285.00	315.00	300.00	0.0092	0.0060	0.0140	100.0000			1,000.00	Option 3: A=75350.06, B=9.00346

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Asphalt Tank 1 - Vertical Fixed Roof Tank
Willits, California

Annual Emission Calcaulations

Standing Losses (lb):	1.2352
Vapor Space Volume (cu ft):	750.4479
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0400
Vented Vapor Saturation Factor:	0.9958
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	750.4479
Tank Diameter (ft):	10.5000
Vapor Space Outage (ft):	8.6667
Tank Shell Height (ft):	48.0000
Average Liquid Height (ft):	40.0000
Roof Outage (ft):	0.6667
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.6667
Roof Height (ft):	2.0000
Roof Slope (ft/ft):	0.3800
Shell Radius (ft):	5.2500
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	100.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0092
Daily Avg. Liquid Surface Temp. (deg. R):	759.6700
Daily Average Ambient Temp. (deg. F):	60.7917
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	759.6700
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,562.1317
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0400
Daily Vapor Temperature Range (deg. R):	30.0000
Daily Vapor Pressure Range (psia):	0.0080
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0092
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0060
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0140
Daily Avg. Liquid Surface Temp. (deg R):	759.6700
Daily Min. Liquid Surface Temp. (deg R):	744.6700
Daily Max. Liquid Surface Temp. (deg R):	774.6700
Daily Ambient Temp. Range (deg. R):	25.4500
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9958
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0092
Vapor Space Outage (ft):	8.6667
Working Losses (lb):	14.2712
Vapor Molecular Weight (lb/lb-mole):	100.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0092
Annual Net Throughput (gal/yr.):	650,000.0000
Annual Turnovers:	21.6667
Turnover Factor:	1.0000

Maximum Liquid Volume (gal):	29,148.3644
Maximum Liquid Height (ft):	45.0000
Tank Diameter (ft):	10.5000
Working Loss Product Factor:	1.0000

Total Losses (lb):	15.5064

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Asphalt Tank 1 - Vertical Fixed Roof Tank
Willits, California

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Asphalt Oil	14.27	1.24	15.51

Toxic Air Contaminant Emission Calculations

Harris Quarry - Proposed Project
Asphalt Dryer Emissions

Operating Parameters

			Typical	
300	ton/hr	ton/hr	300	ton/hr
150,000		ton/yr	50,000	ton/yr

Substance	Chemical Category	Emission Factor	Unit	Typical Emissions lb/hr	Typical Emissions lb/yr	Potential Emissions lb/hr	Potential Emissions lb/yr
Antimony	Metal	1.80E-07	lbs/ton	5.40E-05	9.00E-03	5.40E-05	2.70E-02
Arsenic	Metal	5.60E-07	lbs/ton	1.68E-04	2.80E-02	1.68E-04	8.40E-02
Beryllium	Metal	5.45E-07	lbs/ton	1.64E-04	2.73E-02	1.64E-04	8.18E-02
Cadmium	Metal	4.10E-07	lbs/ton	1.23E-04	2.05E-02	1.23E-04	6.15E-02
Chromium (Hexavalent)	Metal	4.50E-07	lbs/ton	1.35E-04	2.25E-02	1.35E-04	6.75E-02
Copper	Metal	3.10E-06	lbs/ton	9.30E-04	1.55E-01	9.30E-04	4.65E-01
Lead	Metal	1.50E-05	lbs/ton	4.50E-03	7.50E-01	4.50E-03	2.25E+00
Manganese	Metal	7.70E-06	lbs/ton	2.31E-03	3.85E-01	2.31E-03	1.16E+00
Mercury	Metal	2.60E-06	lbs/ton	7.80E-04	1.30E-01	7.80E-04	3.90E-01
Nickel	Metal	6.30E-05	lbs/ton	1.89E-02	3.15E+00	1.89E-02	9.45E+00
Selenium	Metal	3.50E-07	lbs/ton	1.05E-04	1.75E-02	1.05E-04	5.25E-02
Zinc	Metal	6.10E-05	lbs/ton	1.83E-02	3.05E+00	1.83E-02	9.15E+00
Benzo(a)anthracene	PAH	2.10E-07	lbs/ton	6.30E-05	1.05E-02	6.30E-05	3.15E-02
Benzo(a)pyrene	PAH	9.80E-09	lbs/ton	2.94E-06	4.90E-04	2.94E-06	1.47E-03
Benzo(b)fluoranthene	PAH	1.00E-07	lbs/ton	3.00E-05	5.00E-03	3.00E-05	1.50E-02
Benzo(g,h,i)perylene	PAH	4.00E-08	lbs/ton	1.20E-05	2.00E-03	1.20E-05	6.00E-03
Benzo(k)fluoranthene	PAH	4.10E-08	lbs/ton	1.23E-05	2.05E-03	1.23E-05	6.15E-03
Chrysene	PAH	1.80E-07	lbs/ton	5.40E-05	9.00E-03	5.40E-05	2.70E-02
Dibenz(a,h)anthracene	PAH	1.76E-09	lbs/ton	5.28E-07	8.80E-05	5.28E-07	2.64E-04
Indeno(1,2,3-cd)pyrene	PAH	7.00E-09	lbs/ton	2.10E-06	3.50E-04	2.10E-06	1.05E-03
Naphthalene	PAH	6.50E-04	lbs/ton	1.95E-01	3.25E+01	1.95E-01	9.75E+01
Benzene	VOC	3.90E-04	lbs/ton	1.17E-01	1.95E+01	1.17E-01	5.85E+01
Ethylbenzene	VOC	2.40E-04	lbs/ton	7.20E-02	1.20E+01	7.20E-02	3.60E+01
Formaldehyde	VOC	3.10E-03	lbs/ton	9.30E-01	1.55E+02	9.30E-01	4.65E+02
Methyl Chloroform	VOC	4.80E-05	lbs/ton	1.44E-02	2.40E+00	1.44E-02	7.20E+00
Toluene	VOC	2.90E-03	lbs/ton	8.70E-01	1.45E+02	8.70E-01	4.35E+02
Xylenes	VOC	2.00E-04	lbs/ton	6.00E-02	1.00E+01	6.00E-02	3.00E+01

Notes:
(1) Emission factors obtained from AP-42, Section 11.1-15, Table 11.1-9. or
California Air Toxics Emission Factors Database if AP-42 factors are not available.

Harris Quarry - Proposed Project
Silo Loading Emissions

Operating Parameters

300 ton/hr
150,000 ton/yr

EF (Organic PM)=	0.00105(-V) e^((0.0251)*(T+460)-20.43)	**(Ref: Table 11.1-14)**
EF (Total PM)=	0.000332 + 0.00105(-V) e^((0.0251)*(T+460)-20.43)	**(Ref: Table 11.1-14)**
EF (CO)=	0.00488(-V) e^((0.0251)*(T+460)-20.43)	**(Ref: Table 11.1-14)**
EF (TOC)=	0.0504(-V) e^((0.0251)*(T+460)-20.43)	**(Ref: Table 11.1-14)**

V	-0.5	**(Ref: Table 11.1-14)**
T	325 F	**(Ref: Table 11.1-14)**

Control Efficiency	95%

EF (Organic PM)	2.54E-04
EF (Total PM)	5.86E-04
EF (CO)	1.18E-03
EF (TOC)	1.22E-02

Pollutant	Speciation Profile (1)	Uncontrolled Emission Factor (2) in lbs/ton	Controlled Emission Factor	Emission in lbs/hr	Emission in lbs/year
	Compound/Organic PM (in %)				
Benzo(a)anthracene	0.056	1.42E-07	7.11E-09	2.13E-06	1.07E-03
Benzo(a)pyrene	NA				
Benzo(b)fluoranthene	NA				
Benzo(g,h,i)perylene	NA				
Benzo(k)fluoranthene	NA				
Chrysene	0.21	5.33E-07	2.67E-08	8.00E-06	4.00E-03
Dibenz(a,h)anthracene	NA				
Indeno(1,2,3-cd)pyrene	NA				
Naphthalene	1.82	4.62E-06	2.31E-07	6.93E-05	3.47E-02
Phenol	NA				
	Compound/TOC (in %)				
Benzene	0.032	3.90E-06	1.95E-07	5.85E-05	2.92E-02
Bromomethane	0.0049	5.97E-07	2.99E-08	8.96E-06	4.48E-03
2-Butanone	0.039	4.75E-06	2.38E-07	7.13E-05	3.56E-02
Carbon Disulfide	0.016	1.95E-06	9.75E-08	2.92E-05	1.46E-02
Chloroethane	0.004	4.87E-07	2.44E-08	7.31E-06	3.66E-03
Chloromethane	0.023	2.80E-06	1.40E-07	4.20E-05	2.10E-02
Ethylbenzene	0.038	4.63E-06	2.32E-07	6.95E-05	3.47E-02
Formaldehyde	0.69	8.41E-05	4.20E-06	1.26E-03	6.31E-01
n-Hexane	0.10	1.22E-05	6.09E-07	1.83E-04	9.14E-02
Styrene	0.0054	6.58E-07	3.29E-08	9.87E-06	4.94E-03
Toluene	0.062	7.56E-06	3.78E-07	1.13E-04	5.67E-02
Xylenes	0.257	3.13E-05	1.57E-06	4.70E-04	2.35E-01

Notes:
(1) AP-42, Section 11.1, Table 11.1-15 (PAHs and Phenols) or Table 11.1-16 (VOCs).
(2) Emission factors (in lbs/tons of HMA produced) are calculated by multiplying the speciation percentage by emission factor calculated for organic PM for PAHs and phenol or by emission factor calculated for TOC for VOCs.
(3) Overall control efficiency is assumed to be 95% control of volatiles and semi-volatiles.

Harris Quarry - Proposed Project
Truck Load-Out Emissions

Operating Parameters

300	ton/hr
150,000	ton/yr

EF (Organic PM)=	0.00141(-V) e^((0.0251)*(T+460)-20.43)	**(Ref: Table 11.1-14)**
EF (Total PM) =	0.000181 + 0.00141(-V) e^((0.0251)*(T+460)-20.43)	**(Ref: Table 11.1-14)**
EF (CO)=	0.00558(-V) e^((0.0251)*(T+460)-20.43)	**(Ref: Table 11.1-14)**
EF (TOC)=	0.0172(-V) e^((0.0251)*(T+460)-20.43)	**(Ref: Table 11.1-14)**

V	-0.5	**(Ref: Table 11.1-14)**
T	325 F	**(Ref: Table 11.1-14)**

Capture Efficiency	70%
Control Efficiency	95%
Overall Control Efficiency	67%

EF (Organic PM)	3.41E-04
EF (Total PM)	1.53E-03
EF (CO)	1.35E-03
EF (TOC)	4.16E-03

Pollutant	Speciation Profile (1)	Uncontrolled Emission Factor (2)	Controlled Emission Factor	Emission in lbs/hr	Emission in lbs/year
	Compound/Organic PM (in %)				
Benzo(a)anthracene	0.019	6.48E-08	2.17E-08	6.51E-06	3.26E-03
Benzo(a)pyrene	0.0023	7.84E-09	2.63E-09	7.88E-07	3.94E-04
Benzo(b)fluoranthene	0.0076	2.59E-08	8.68E-09	2.60E-06	1.30E-03
Benzo(g,h,i)perylene	0.0019	6.48E-09	2.17E-09	6.51E-07	3.26E-04
Benzo(k)fluoranthene	0.0022	7.50E-09	2.51E-09	7.54E-07	3.77E-04
Chrysene	0.103	3.51E-07	1.18E-07	3.53E-05	1.76E-02
Dibenz(a,h)anthracene	0.00037	1.26E-09	4.23E-10	1.27E-07	6.34E-05
Indeno(1,2,3-cd)pyrene	0.00047	1.60E-09	5.37E-10	1.61E-07	8.05E-05
Naphthalene	1.25	4.26E-06	1.43E-06	4.28E-04	2.14E-01
Phenol	1.18	4.02E-06	1.35E-06	4.04E-04	2.02E-01
	Compound/TOC (in %)				
Benzene	0.052	2.16E-06	7.24E-07	2.17E-04	1.09E-01
Bromomethane	0.0096	3.99E-07	1.34E-07	4.01E-05	2.01E-02
2-Butanone	0.049	2.04E-06	6.83E-07	2.05E-04	1.02E-01
Carbon Disulfide	0.013	5.41E-07	1.81E-07	5.43E-05	2.72E-02
Chloroethane	0.00021	8.73E-09	2.93E-09	8.78E-07	4.39E-04
Chloromethane	0.015	6.24E-07	2.09E-07	6.27E-05	3.13E-02
Ethylbenzene	0.28	1.16E-05	3.90E-06	1.17E-03	5.85E-01
Formaldehyde	0.088	3.66E-06	1.23E-06	3.68E-04	1.84E-01
n-Hexane	0.15	6.24E-06	2.09E-06	6.27E-04	3.13E-01
Styrene	0.0073	3.04E-07	1.02E-07	3.05E-05	1.53E-02
Tetrachloroethene	0.0077	3.20E-07	1.07E-07	3.22E-05	1.61E-02
Toluene	0.21	8.73E-06	2.93E-06	8.78E-04	4.39E-01
Trichlorotrifluoromethane	0.0013	5.41E-08	1.81E-08	5.43E-06	2.72E-03
Xylenes	0.49	2.04E-05	6.83E-06	2.05E-03	1.02E+00

Notes:
(1) AP-42, Section 11.1, Table 11.1-15 (PAHs and Phenols) or Table 11.1-16 (VOCs).
(2) Emission factors (in lbs/tons of HMA produced) are calculated by multiplying the speciation percentage by emission factor calculated for organic PM for PAHs and phenol or by emission factor calculated for TOC for VOCs.
(3) Overall control efficiency for PAHs and phenol (semi-volatiles) is assumed to be 67% (70% capture and 95% control).

Harris Quarry - Proposed Project
Hot Oil System Emissions

Operating Parameters

Burner Information		
1.2	MMBtu/hr	
8.76	gal/hr	No. 2 diesel
76730	gal/year	No. 2 diesel

		Potential Emissions	
Substance	Emission Factor (1) (lb/gal)	Maximum Hourly (lbs/hr)	Annual Average (lbs/year)
Formaldehyde	3.5E-06	3.07E-05	2.69E-01
Benzo(b)fluoranthene	1.0E-07	8.76E-07	7.67E-03
Naphthalene	1.7E-05	1.49E-04	1.30E+00
Dioxins	2.0E-10	1.75E-09	1.53E-05
Furans	2.3E-10	2.01E-09	1.76E-05

Notes:
(1) Emission factors AP-42, Section 11.1, Table 11.1-13.

Harris Quarry - Proposed Project
Asphalt Storage Tank Emissions

Operating Parameters

300	ton/hr
150,000	ton/yr

Organic PM Emissions

TOC Emissions	31.02	lb/yr
Working Loss	28.54	lb/yr
Breathing Loss	2.48	lb/yr

TOC emissions from TANKS

Pollutant	**Speciation Profile (1)** Compound/ TOC (in %)	**Emission (lbs/hr)**	**Emission (lbs/year)**
Benzene	0.032	1.13E-06	9.93E-03
Bromomethane	0.0049	1.74E-07	1.52E-03
2-Butanone	0.039	1.38E-06	1.21E-02
Carbon Disulfide	0.016	5.67E-07	4.96E-03
Chloroethane	0.004	1.42E-07	1.24E-03
Chloromethane	0.023	8.14E-07	7.13E-03
Ethylbenzene	0.038	1.35E-06	1.18E-02
Formaldehyde	0.69	2.44E-05	2.14E-01
n-Hexane	0.10	3.54E-06	3.10E-02
Styrene	0.0054	1.91E-07	1.68E-03
Toluene	0.062	2.20E-06	1.92E-02
Xylenes	0.257	9.10E-06	7.97E-02

Notes:
(1) AP-42, Section 11.1, Table 11.1-16 (VOCs).
(2) Emission are calculated by multiplying the speciation percentage by TOC emissio

Harris Quarry Existing Permitted Production - 2020
Daily and Annual Emissions From Vehicle Travel

Trip Type	Average Daily Trips*	Trip Length (mi)	Daily Emissions (lb/day)							
						PM10		PM2.5		
			NOx	CO	VOC	(exhaust)	(total)	(exhaust)	(total)	CO2
On-site Travel										
Trucks - Access Road to Quarry	66	0.16	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00
Trucks - Quarry Travel	66	0.09	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00
Subtotal			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Site Travel										
Trucks - Aggregate Haul	66	30	0.00	0.00	0.00	0.80	1.08	0.00	0.00	0.00
Trucks - Other	18	22	0.00	0.00	0.00	0.16	0.22	0.00	0.00	0.00
Worker Vehicles - Commute	24	22	0.00	0.00	0.00	0.02	0.05	0.00	0.00	0.00
Subtotal			0.0	0.0	0.0	0.8	1.1	0.0	0.0	0.0
Total			**0.0**	**0.0**	**0.0**	**0.8**	**1.2**	**0.0**	**0.0**	**0.0**

* Based on number of average daily trips in July.

Annual Average Emissions (tons/year)

Trip Type	Annual Trips	Trip Length (mi)	Annual Emissions (tons/year)							
						PM10		PM2.5		
			NOx	CO	VOC	(exhaust)	(total)	(exhaust)	(total)	CO2
On-site Travel										
Trucks - Access Road to Quarry	11625	0.16	0.00	0.00	0.00	0.0008	0.0016	0.0000	0.0000	0.0
Trucks - Quarry Travel	11625	0.09	0.00	0.00	0.00	0.0009	0.0022	0.0000	0.0000	0.0
Subtotal			0.0	0.0	0.0	0.0017	0.0037	0.0000	0.0000	0.0
Off-Site Travel										
Trucks - Product Pickup/Delivery	11625	30	0.00	0.0	0.00	0.07	0.10	0.00	0.00	0.0
Trucks - Other	3170	22	0.00	0.0	0.00	0.01	0.02	0.00	0.00	0.0
Worker Vehicles - Commute	4227	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Subtotal			0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total			**0.0**	**0.00**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**

* Based on annual production levels and truck capacities.

Emission Factors

Vehicle Type	Travel Speed (mph)	Emission Factor Units	NOx	CO	VOC	PM10 (Exhaust)	PM10 (Total)	PM2.5 (Exhaust)	PM2.5 (Total)	CO2
Heavy-Duty Diesel Trucks	10	gram/VMT				0.271	0.335			
Heavy-Duty Diesel Trucks	55	gram/VMT				0.182	0.246			
Heavy-Duty Diesel Trucks	Idle	gram/hour				0.538	1.673			
Worker Vehicles	60	gram/VMT				0.02	0.041			

Emission factors from EMFAC2007

Truck idle time (min) = 5

Harris Quarry Off-Road Equipment Exhaust Emissions
Quarry Operation at Existing Permmitted Production - 2020

Analysis Year = 2020 Existing Equipment

Item No.	Equipment Type	No. Units	Engine Age (years)	Engine Model Year	Daily Hours In Use	Days Per Year	Unit Annual Hours Use	Use Factor	Load Factor	Cumulative Hours Operation Per Unit	Engine (hp)	Level of VDECS Used	Emission Factor (g/hp-hr) NOx	CO	VOC	PM10	SO2	CO2	Daily Emissions (lb/day) NOx	CO	VOC	PM10	SO2	CO2	Annual Emissions (ton/yr) NOx	CO	VOC	PM10	SO2	CO2
Quarry Equipment																														
1	2,012 hp Generator	1	13	2007	9	140	1260	1.00	0.74	16,380	2012	3	3.75	1.19	0.20	0.015	0.006	568.3	110.9	35.2	5.8	0.4	0.17	16789	7.76	2.47	0.41	0.03	0.012	1175
2	30 hp Generator (well)	1	15	2005	4	140	560	1.00	0.74	8,400	30	0	5.46	5.56	0.95	0.50	0.007	568.3	1.1	1.1	0.2	0.1	0.00	111	0.07	0.08	0.01	0.01	0.000	8
3	22 hp Generator (scale	1	8	2012	9	140	1260	1.00	0.74	10,080	22	0	4.33	2.34	0.57	0.16	0.007	568.3	1.4	0.8	0.2	0.1	0.00	184	0.10	0.05	0.01	0.00	0.000	13
4	Cat 980C Loader	1	4	2016	8	140	1120	0.00	0.54	4,480	270	0	0.27	1.00	0.10	0.01	0.006	568.3	0.0	0.0	0.0	0.0	0.00	0	0.00	0.00	0.00	0.00	0.000	0
5	Cat 980F Loader	1	8	2012	8	140	1120	1.00	0.54	8,960	275	0	1.44	1.08	0.23	0.01	0.006	568.3	3.8	2.8	0.6	0.0	0.01	1488	0.26	0.20	0.04	0.00	0.001	104
6	Cat 980G Loader	1	6	2014	8	140	1120	1.00	0.54	6,720	300	0	0.28	1.04	0.13	0.01	0.006	568.3	0.8	3.0	0.4	0.0	0.02	1624	0.06	0.21	0.03	0.00	0.001	114
7	Cat 226B Skid Steer	1	14	2006	4	140	560	1.00	0.54	7,840	61	0	5.30	3.73	0.40	0.30	0.007	568.3	1.5	1.1	0.1	0.1	0.00	165	0.11	0.08	0.01	0.01	0.000	12
8	Cat D11R Bulldozer	1	1	2019	8	140	1120	1.00	0.64	1,120	850	0	2.27	0.94	0.06	0.02	0.006	568.3	21.8	9.0	0.6	0.2	0.05	5453	1.52	0.63	0.04	0.01	0.004	382
9	Cat 345BL Excavator	1	12	2008	8	140	1120	1.00	0.57	13,440	300	0	2.68	1.14	0.40	0.14	0.006	568.3	8.1	3.4	1.2	0.4	0.02	1714	0.57	0.24	0.08	0.03	0.001	120
	TOTAL	**-**			**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**	**-**	**-**	**-**			**149.4**	**56.4**	**9.1**	**1.3**	**0.3**	**27,527**	**10.46**	**3.95**	**0.64**	**0.09**	**0.019**	**1,927**
	***** Tier 1 engine (~1978), Rebuilt in 2005																		**Quarry equipment without generators -->**	**36.0**	**19.4**	**2.9**	**0.7**	**0.1**	**10444**	**2.52**	**1.35**	**0.20**	**0.052**	**0.01**	**731**

Emission Factors - Off-Road Compression Ignited Engines

Item No.	EF ID	NOx ZH EF (g/hp-hr)	NOx DR (g/hp-hr^2)	NOx Fuel CF	CO ZH EF (g/hp-hr)	CO DR (g/hp-hr^2)	CO Fuel CF	ROG ZH EF (g/hp-hr)	ROG DR (g/hp-hr^2)	ROG Fuel CF	PM10 ZH EF (g/hp-hr)	PM10 DR (g/hp-hr^2)	PM10 Fuel CF	CO2 ZH EF (g/hp-hr)	CO2 DR (g/hp-hr^2)	CO2 Fuel CF	SO2 (g/hp-hr)
1	ULSD99992007	4.51	6.32E-05	0.95	0.92	1.82E-05	1.00	0.14	2.22E-05	1.00	0.11	6.03E-06	0.80	568.30	0.00E+00	1.00	0.006
2	ULSD502005	4.95	9.67E-05	0.95	3.00	3.05E-04	1.00	0.37	6.90E-05	1.00	0.38	2.93E-05	0.80	568.30	0.00E+00	1.00	0.007
3	ULSD252012	4.57	0.00E+00	0.95	2.34	0.00E+00	1.00	0.57	0.00E+00	1.00	0.19	0.00E+00	0.85	568.30	0.00E+00	1.00	0.007
4	ULSD5002016	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
5	ULSD5002012	1.36	1.75E-05	0.95	0.92	1.82E-05	1.00	0.07	1.83E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
6	ULSD5002014	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
7	ULSD1202006	5.01	7.45E-05	0.95	3.09	8.21E-05	1.00	0.19	2.71E-05	1.00	0.24	1.76E-05	0.80	568.30	0.00E+00	1.00	0.007
8	ULSD10002019	2.36	3.00E-05	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.02	1.00E-06	0.85	568.30	0.00E+00	1.00	0.006
9	ULSD5002008	2.45	3.18E-05	0.95	0.92	1.82E-05	1.00	0.10	2.50E-05	1.00	0.11	5.55E-06	0.80	568.30	0.00E+00	1.00	0.006

Notes: ZH EF = Zero hour emission factor
DR = Deterioration rate
ULSD = Ultra low sulfur diesel (15 ppmw sulfur, 0.0015% sulfur)

Refs: CARB OFFFROAD2007 model (http://www.arb.ca.gov/msei/offroad/offroad.htm), December, 2006.
Stationary/Off-road engines ARB, "California's Emissions Inventory for Off-Road Large Compressio-Ignited (CI) Engines (> 25 HP)" MAC#99-32

Proposed Harris Quarry - Daily and Annual Emissions From Vehicle Travel - 2020
Daily and Annual Emissions From Vehicle Travel

Average Daily Emissions

Trip Type	Average Daily Trips*	Trip Length (mi)	Average Daily Emissions (lb/day)							
						PM10		PM2.5		
			NOx	CO	VOC	(exhaust)	(total)	(exhaust)	(total)	CO2
On-site Travel										
Trucks - Access Road to Quarry	162	0.16	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00
Trucks - Quarry Travel	196	0.091	0.00	0.00	0.00	0.03	0.07	0.00	0.00	0.00
Trucks - Quarry to Asphalt Plant	52	0.58	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00
Trucks - Off-site to Asphalt Plant	52	0.23	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00
Subtotal			0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0
Off-Site Travel										
Trucks - Aggregate	122	30	0.00	0.00	0.00	1.47	2.00	0.00	0.00	0.00
Trucks - Asphalt	52	30	0.00	0.00	0.00	0.63	0.85	0.00	0.00	0.00
Turcks - Transfer to Willits	22	6	0.00	0.00	0.00	0.05	0.07	0.00	0.00	0.00
Trucks - Other	18	22	0.00	0.00	0.00	0.16	0.22	0.00	0.00	0.00
Worker Vehicles - Commute	33	22	0.00	0.00	0.00	0.03	0.07	0.00	0.00	0.00
Subtotal			0.0	0.0	0.0	2.3	3.2	0.0	0.0	0.0
Total			**0.0**	**0.0**	**0.0**	**2.4**	**3.4**	**0.0**	**0.0**	**0.0**

* Based on number of average daily trips in July.

Annual Average Emissions (tons/year)

Trip Type	Annual Trips	Trip Length (mi)	Annual Emissions (tons/year)							
						PM10		PM2.5		
			NOx	CO	VOC	(exhaust)	(total)	(exhaust)	(total)	CO2
On-site Travel										
Trucks - Off-site to Quarry	28,865	0.16	0.00	0.00	0.00	0.002	0.004	0.000	0.000	0.00
Trucks - Quarry Travel	31,320	0.09	0.00	0.00	0.00	0.002	0.006	0.000	0.000	0.00
Trucks - Quarry to Asphalt Plant	7,285	0.58	0.00	0.00	0.00	0.002	0.003	0.000	0.000	0.00
Trucks - Off-site to Asphalt Plant	7,285	0.42	0.00	0.00	0.00	0.001	0.002	0.000	0.000	0.00
Subtotal			0.0	0.0	0.0	0.007	0.014	0.000	0.000	0.0
Off-Site Travel										
Trucks - Aggregate	20,315	30	0.00	0.0	0.00	0.123	0.17	0.00	0.00	0.00
Trucks - Asphalt	7,285	30	0.00	0.0	0.00	0.044	0.06	0.00	0.00	0.00
Trucks - Transfer to Willits	3,720	6	0.00	0.0	0.00	0.005	0.01	0.00	0.00	0.00
Trucks - Other	4,830	22	0.00	0.0	0.00	0.021	0.03	0.00	0.00	0.00
Worker Vehicles - Commute	5,574	22	0.00	0.00	0.00	0.003	0.01	0.00	0.00	0.00
Subtotal			0.0	0.0	0.0	0.196	0.3	0.0	0.0	0.0
Total			**0.0**	**0.00**	**0.0**	**0.2**	**0.3**	**0.0**	**0.0**	**0**

* Based on annual production levels and truck capacities.

Emission Factors

Vehicle Type	Travel Speed (mph)	Emission Factor Units	NOx	CO	VOC	PM10 (Exhaust)	PM10 (Total)	PM2.5 (Exhaust)	PM2.5 (Total)	CO2
Heavy-Duty Diesel Trucks (HHD)	10	gram/VMT				0.271	0.335			
Heavy-Duty Diesel Trucks (HHD)	55	gram/VMT				0.182	0.246			
Heavy-Duty Diesel Trucks (HHD)	Idle	gram/hour				0.538	1.673			
Worker Vehicles (LDT2)	60	gram/VMT				0.02	0.041			

Emission factors from EMFAC2007

Truck idle time (min) = 5

Harris Quarry Off-Road Equipment Exhaust Emissions
Proposed Quarry Operation at Increased Production Levels- 2020

Analysis Year = 2020 Existing Equipment

Item No.	Equipment Type	No. Units	Engine Age (years)	Engine Model Year	Daily Hours In Use	Days Per Year	Unit Annual Hours Use	Use Factor	Load Factor	Cumulative Hours Operation Per Unit	Engine (hp)	Level of VDECS Used	Emission Factor (g/hp-hr)						Daily Emissions (lb/day)						Annual Emissions (ton/yr)					
													NOx	CO	VOC	PM10	SO2	CO2	NOx	CO	VOC	PM10	SO2	CO2	NOx	CO	VOC	PM10	SO2	CO2
Quarry Equipment																														
1	2,012 hp Generator	1	13	2007	9	170	1530	1.00	0.74	19,890	2012	3	3.75	1.19	0.20	0.015	0.006	568.3	110.9	35.2	5.8	0.4	0.17	16789	9.43	3.00	0.50	0.04	0.014	1427
2	30 hp Generator (well)	1	15	2005	4	170	680	1.00	0.74	10,200	30	0	5.63	6.11	1.07	0.54	0.007	568.3	1.1	1.2	0.2	0.1	0.00	111	0.09	0.10	0.02	0.01	0.000	9
3	22 hp Generator (scale	1	8	2012	9	170	1530	1.00	0.74	12,240	22	0	4.33	2.34	0.57	0.16	0.007	568.3	1.4	0.8	0.2	0.1	0.00	184	0.12	0.06	0.02	0.00	0.000	16
4	Cat 980C Loader	1	4	2016	8	170	1360	0.00	0.54	5,440	270	0	0.28	1.02	0.11	0.01	0.006	568.3	0.0	0.0	0.0	0.0	0.00	0	0.00	0.00	0.00	0.00	0.000	0
5	Cat 980F Loader	1	8	2012	8	170	1360	1.00	0.54	10,880	275	0	1.47	1.12	0.27	0.01	0.006	568.3	3.8	2.9	0.7	0.0	0.01	1488	0.33	0.25	0.06	0.00	0.001	127
6	Cat 980G Loader	1	6	2014	8	170	1360	1.00	0.54	8,160	300	0	0.28	1.07	0.15	0.01	0.006	568.3	0.8	3.1	0.4	0.0	0.02	1624	0.07	0.26	0.04	0.00	0.001	138
7	Cat 226B Skid Steer	1	14	2006	4	170	680	1.00	0.54	9,520	61	0	5.42	3.87	0.45	0.33	0.007	568.3	1.6	1.1	0.1	0.1	0.00	165	0.13	0.10	0.01	0.01	0.000	14
8	Cat D11R Bulldozer	1	1	2019	8	170	1360	1.00	0.64	1,360	850	0	2.28	0.94	0.07	0.02	0.006	568.3	21.8	9.1	0.6	0.2	0.05	5453	1.86	0.77	0.05	0.01	0.005	463
9	Cat 345BL Excavator	1	12	2008	8	170	1360	1.00	0.57	16,320	300	0	2.68	1.14	0.40	0.14	0.006	568.3	8.1	3.4	1.2	0.4	0.02	1714	0.69	0.29	0.10	0.04	0.001	146
	Subtotal																		**149.6**	**56.8**	**9.3**	**1.4**	**0.28**	**27527**	**12.72**	**4.83**	**0.79**	**0.12**	**0.024**	**2340**
Asphalt Plant Equipment																														
10	Cat 966H Loader - A	1	1	2009	8	140	1120	1.00	0.54	12,320	262	0	2.68	1.14	0.40	0.14	0.006	568.3	6.7	2.8	1.0	0.4	0.01	1418	0.47	0.20	0.07	0.02	0.001	99
	Subtotal																		**6.7**	**2.8**	**1.0**	**0.4**	**0.01**	**1418**	**0.47**	**0.20**	**0.07**	**0.0247**	**0.001**	**99**
	TOTAL	**-**			**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**	**-**	**-**	**-**			**156.3**	**59.6**	**10.3**	**1.7**	**0.3**	**28,945**	**13.18**	**5.03**	**0.86**	**0.14**	**0.024**	**2,439**
	Quarry equipment without generators -->																		**36.2**	**19.60**	**3.09**	**0.76**	**0.10**	**10444**	**3.07**	**1.67**	**0.26**	**0.0645**	**0.01**	**888**

***** Tier 1 engine (~1978), Rebuilt in 2005

Emission Factors - Off-Road Compression Ignited Engines

Item No.	EF ID	NOx ZH EF (g/hp-hr)	NOx DR (g/hp-hr^2)	NOx Fuel CF	CO ZH EF (g/hp-hr)	CO DR (g/hp-hr^2)	CO Fuel CF	ROG ZH EF (g/hp-hr)	ROG DR (g/hp-hr^2)	ROG Fuel CF	PM10 ZH EF (g/hp-hr)	PM10 DR (g/hp-hr^2)	PM10 Fuel CF	CO2 ZH EF (g/hp-hr)	CO2 DR (g/hp-hr^2)	CO2 Fuel CF	SO2 (g/hp-hr)
1	ULSD99992007	4.51	6.32E-05	0.95	0.92	1.82E-05	1.00	0.14	2.22E-05	1.00	0.11	6.03E-06	0.80	568.30	0.00E+00	1.00	0.006
2	ULSD502005	4.95	9.67E-05	0.95	3.00	3.05E-04	1.00	0.37	6.90E-05	1.00	0.38	2.93E-05	0.80	568.30	0.00E+00	1.00	0.007
3	ULSD252012	4.57	0.00E+00	0.95	2.34	0.00E+00	1.00	0.57	0.00E+00	1.00	0.19	0.00E+00	0.85	568.30	0.00E+00	1.00	0.007
4	ULSD5002016	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
5	ULSD5002012	1.36	1.75E-05	0.95	0.92	1.82E-05	1.00	0.07	1.83E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
6	ULSD5002014	0.27	3.75E-06	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.01	3.75E-07	0.85	568.30	0.00E+00	1.00	0.006
7	ULSD1202006	5.01	7.45E-05	0.95	3.09	8.21E-05	1.00	0.19	2.71E-05	1.00	0.24	1.76E-05	0.80	568.30	0.00E+00	1.00	0.007
8	ULSD10002019	2.36	3.00E-05	0.95	0.92	1.82E-05	1.00	0.05	1.17E-05	1.00	0.02	1.00E-06	0.85	568.30	0.00E+00	1.00	0.006
9	ULSD5002008	2.45	3.18E-05	0.95	0.92	1.82E-05	1.00	0.10	2.50E-05	1.00	0.11	5.55E-06	0.80	568.30	0.00E+00	1.00	0.006
10	ULSD5002009	2.45	3.18E-05	0.95	0.92	1.82E-05	1.00	0.10	2.50E-05	1.00	0.11	5.55E-06	0.80	568.30	0.00E+00	1.00	0.006

Notes ZH EF = Zero hour emission factor
DR = Deterioration rate
ULSD = Ultra low sulfur diesel (15 ppmw sulfur, 0.0015% sulfur)

Refs: CARB OFFFROAD2007 model (http://www.arb.ca.gov/msei/offroad/offroad.htm), December, 2006.
Stationary/Off-road engines ARB, "California's Emissions Inventory for Off-Road Large Compressio-Ignited (CI) Engines (> 25 HP)" MAC#99-32

Emission Rates for Crystalline Silica Modeling

Proposed Project - PM10/Silica Modeling

Crystalline Silica Content of Dust = 10.0%

Quarry	**2010 PM10 Annual Emis Rate (ton/yr)**	**PM10 Ann Ave Emis Rate (lb/yr)**	**PM10 Model Emis Rate (lb/hr)**	**Silica Model Emis Rate (lb/hr)**
Quarry Processing	1.23	2460.0	0.6721	0.0672
Processing Modeling Area Source				
	(m2)	(%)	(lb/hr)	
QE1	8825.6	100.0%	0.6721	0.0672
Quarry Fugitives	1.99	3980.0	1.0874	0.1087
Mobile Equipment Modeling Sources				
	(m2)	(%)	(lb/hr)	
QE1	8825.6	12.6%	0.1372	0.0137
QE2	15220.8	21.8%	0.2367	0.0237
QE3	25479.1	36.4%	0.3962	0.0396
QE4	20409.8	29.2%	0.3174	0.0317
	69935.3	100%	1.0874	0.1087

Asphalt Plant	**2010 Annual Emis Rate (ton/yr)**	**Ann Ave Emis Rate (lb/yr)**	**Model Emis Rate (lb/hr)**	
Mobile Equipment	-	8.4	0.0023	0.0002
Mobile Equipment Modeling Sources				
Vol1			0.0011	0.0001
Vol2			0.0011	0.0001

On-Site Trucks

Trucks - Off-site to Quarry (PHAUL1)	0.0000
Trucks - Quarry Travel (TRUCKQRY)	0.0000
Trucks - Quarry to Asphalt Plant (PHAUL2)	0.0000
Trucks - Off-site to Asphalt Plant (PHAUL3)	0.0000

Notes

Proposed Quarry

Hours per Day =	10
Annual Hours for modeling =	3660

Odor Compound Emissions and Modeling Results

Summary of Odor Compound Modeling - Individual Compound 1-Hour Maximum Concentrations
Proposed Harris Project

Sensitive Receptor Name	Rec. No.	X/Q (ug/m3)	Total Concentration (ug/m3															
			Benzene	Carbon Disulfide	Ethyl Benzene	Ethyl Chloride	Formaldehyde	Hexane	Methyl Bromide	Methyl Chloride	Methyl Chloroform	Methyl Ethyl Ketone	Naphthalene	Perchloroethylene	Phenol	Styrene	Toluene	Xylene
CDF	1	1.60E+02	7.56E-02	4.81E-04	5.33E-02	3.94E-05	5.96E-01	4.84E-03	2.97E-04	5.94E-04	9.10E-03	1.63E-03	1.27E-01	2.05E-04	2.58E-03	2.40E-04	5.56E-01	5.32E-02
CDF	2	1.11E+02	6.71E-02	3.28E-04	4.58E-02	2.78E-05	5.30E-01	3.27E-03	2.00E-04	4.05E-04	8.12E-03	1.11E-03	1.12E-01	1.37E-04	1.72E-03	1.62E-04	4.94E-01	4.41E-02
CDF	3	1.18E+02	5.80E-02	3.52E-04	4.07E-02	2.76E-05	4.58E-01	3.56E-03	2.19E-04	4.32E-04	6.99E-03	1.20E-03	9.74E-02	1.53E-04	1.92E-03	1.76E-04	4.27E-01	4.04E-02
CDF	4	1.08E+02	5.11E-02	3.20E-04	3.59E-02	2.71E-05	4.03E-01	3.19E-03	1.96E-04	3.96E-04	6.15E-03	1.08E-03	8.57E-02	1.34E-04	1.68E-03	1.59E-04	3.76E-01	3.57E-02
CDF	5	9.80E+01	6.22E-02	2.79E-04	4.21E-02	2.42E-05	4.92E-01	2.77E-03	1.70E-04	3.46E-04	7.54E-03	9.39E-04	1.04E-01	1.15E-04	1.45E-03	1.38E-04	4.59E-01	4.01E-02
CDF	6	9.65E+01	8.18E-02	2.70E-04	5.41E-02	2.34E-05	6.48E-01	2.69E-03	1.65E-04	3.35E-04	9.96E-03	9.11E-04	1.37E-01	1.12E-04	1.41E-03	1.34E-04	6.05E-01	4.99E-02
Max		***1.60E+02***	***8.18E-02***	***4.81E-04***	***5.41E-02***	***3.94E-05***	***6.48E-01***	***4.84E-03***	***2.97E-04***	***5.94E-04***	***9.96E-03***	***1.63E-03***	***1.37E-01***	***2.05E-04***	***2.58E-03***	***2.40E-04***	***6.05E-01***	***5.32E-02***
101 Bus	7	8.72E+02	9.53E-02	1.90E-03	7.92E-02	2.35E-04	7.57E-01	1.73E-02	1.02E-03	2.44E-03	1.10E-02	5.99E-03	1.64E-01	6.07E-04	7.62E-03	8.70E-04	6.85E-01	9.85E-02
101 Bus	8	1.60E+03	1.02E-01	4.87E-03	1.25E-01	4.73E-04	7.75E-01	4.73E-02	2.87E-03	6.10E-03	1.05E-02	1.61E-02	1.73E-01	1.88E-03	2.37E-02	2.36E-03	6.94E-01	1.91E-01
101 Bus	9	2.42E+03	9.53E-02	8.17E-03	1.73E-01	6.78E-04	6.75E-01	8.19E-02	5.02E-03	1.01E-02	8.28E-03	2.77E-02	1.64E-01	3.46E-03	4.34E-02	4.07E-03	6.04E-01	2.92E-01
101 Bus	10	1.43E+03	8.63E-02	5.65E-03	1.44E-01	3.16E-04	5.95E-01	6.01E-02	3.75E-03	6.79E-03	8.08E-03	2.00E-02	1.49E-01	2.78E-03	3.49E-02	2.96E-03	5.68E-01	2.26E-01
101 Bus	11	3.34E+02	4.13E-02	1.21E-03	4.36E-02	8.25E-05	3.13E-01	1.25E-02	7.74E-04	1.47E-03	4.56E-03	4.19E-03	7.07E-02	5.55E-04	6.97E-03	6.17E-04	2.92E-01	5.86E-02
101 Bus	12	2.70E+02	5.93E-02	9.51E-04	5.06E-02	6.76E-05	4.59E-01	9.79E-03	6.05E-04	1.16E-03	6.88E-03	3.29E-03	1.00E-01	4.31E-04	5.41E-03	4.84E-04	4.28E-01	5.97E-02
101 Bus	13	3.11E+02	5.92E-02	1.12E-03	5.32E-02	7.80E-05	4.56E-01	1.16E-02	7.16E-04	1.36E-03	6.80E-03	3.88E-03	1.00E-01	5.11E-04	6.43E-03	5.71E-04	4.26E-01	6.50E-02
Max		***2.42E+03***	***1.02E-01***	***8.17E-03***	***1.73E-01***	***6.78E-04***	***7.75E-01***	***8.19E-02***	***5.02E-03***	***1.01E-02***	***1.10E-02***	***2.77E-02***	***1.73E-01***	***3.46E-03***	***4.34E-02***	***4.07E-03***	***6.94E-01***	***2.92E-01***
Mobile	14	8.27E+01	9.06E-02	1.91E-04	5.81E-02	1.99E-05	7.19E-01	1.82E-03	1.10E-04	2.40E-04	1.11E-02	6.23E-04	1.51E-01	7.04E-05	8.85E-04	9.10E-05	6.71E-01	5.18E-02
Mobile	15	6.66E+01	4.65E-02	1.54E-04	3.05E-02	1.60E-05	3.69E-01	1.47E-03	8.90E-05	1.94E-04	5.67E-03	5.05E-04	7.79E-02	5.71E-05	7.18E-04	7.37E-05	3.44E-01	2.82E-02
Mobile	16	6.74E+01	4.47E-02	1.84E-04	3.00E-02	1.70E-05	3.54E-01	1.80E-03	1.10E-04	2.29E-04	5.43E-03	6.13E-04	7.50E-02	7.33E-05	9.20E-04	8.98E-05	3.30E-01	2.83E-02
Mobile	17	7.00E+01	4.22E-02	1.87E-04	2.84E-02	1.74E-05	3.34E-01	1.83E-03	1.12E-04	2.33E-04	5.12E-03	6.24E-04	7.07E-02	7.45E-05	9.36E-04	9.13E-05	3.11E-01	2.70E-02
Mobile	18	8.15E+01	7.86E-02	1.87E-04	5.07E-02	1.97E-05	6.24E-01	1.78E-03	1.08E-04	2.36E-04	9.61E-03	6.11E-04	1.32E-01	6.88E-05	8.64E-04	8.92E-05	5.82E-01	4.55E-02
Mobile	19	6.59E+01	4.57E-02	1.67E-04	3.03E-02	1.54E-05	3.62E-01	1.64E-03	9.96E-05	2.08E-04	5.55E-03	5.56E-04	7.65E-02	6.66E-05	8.36E-04	8.14E-05	3.37E-01	2.82E-02
Mobile	20	7.42E+01	4.39E-02	2.02E-04	2.97E-02	1.87E-05	3.47E-01	1.98E-03	1.21E-04	2.52E-04	5.32E-03	6.73E-04	7.35E-02	8.05E-05	1.01E-03	9.86E-05	3.24E-01	2.83E-02
Mobile	21	7.44E+01	4.16E-02	1.97E-04	2.82E-02	1.83E-05	3.29E-01	1.93E-03	1.17E-04	2.45E-04	5.04E-03	6.56E-04	6.97E-02	7.83E-05	9.84E-04	9.60E-05	3.07E-01	2.70E-02
Mobile	22	7.89E+01	6.67E-02	1.80E-04	4.32E-02	1.90E-05	5.29E-01	1.71E-03	1.03E-04	2.27E-04	8.14E-03	5.86E-04	1.12E-01	6.57E-05	8.25E-04	8.55E-05	4.94E-01	3.92E-02
Mobile	23	6.97E+01	4.55E-02	1.93E-04	3.05E-02	1.78E-05	3.60E-01	1.90E-03	1.15E-04	2.40E-04	5.52E-03	6.44E-04	7.62E-02	7.72E-05	9.70E-04	9.43E-05	3.36E-01	2.89E-02
Mobile	24	8.08E+01	4.28E-02	2.18E-04	2.92E-02	2.02E-05	3.38E-01	2.14E-03	1.30E-04	2.72E-04	5.17E-03	7.28E-04	7.17E-02	8.71E-05	1.09E-03	1.07E-04	3.15E-01	2.82E-02
Mobile	25	7.73E+01	4.00E-02	2.01E-04	2.73E-02	1.88E-05	3.17E-01	1.97E-03	1.20E-04	2.51E-04	4.84E-03	6.70E-04	6.71E-02	7.98E-05	1.00E-03	9.81E-05	2.95E-01	2.63E-02
Max		***8.27E+01***	***9.06E-02***	***2.18E-04***	***5.81E-02***	***2.02E-05***	***7.19E-01***	***2.14E-03***	***1.30E-04***	***2.72E-04***	***1.11E-02***	***7.28E-04***	***1.51E-01***	***8.71E-05***	***1.09E-03***	***1.07E-04***	***6.71E-01***	***5.18E-02***
GoldRule	26	1.27E+02	4.97E-02	3.51E-04	3.53E-02	3.18E-05	3.93E-01	3.46E-03	2.11E-04	4.37E-04	5.98E-03	1.17E-03	8.36E-02	1.42E-04	1.78E-03	1.72E-04	3.65E-01	3.57E-02
GoldRule	27	1.10E+02	4.29E-02	2.93E-04	3.03E-02	2.65E-05	3.39E-01	2.88E-03	1.76E-04	3.64E-04	5.16E-03	9.78E-04	7.21E-02	1.18E-04	1.48E-03	1.43E-04	3.15E-01	3.05E-02
GoldRule	28	6.90E+01	3.49E-02	1.73E-04	2.38E-02	1.57E-05	2.76E-01	1.70E-03	1.04E-04	2.15E-04	4.22E-03	5.78E-04	5.85E-02	6.96E-05	8.74E-04	8.46E-05	2.57E-01	2.29E-02
GoldRule	29	4.08E+01	3.49E-02	1.10E-04	2.29E-02	1.04E-05	2.77E-01	1.08E-03	6.56E-05	1.38E-04	4.25E-03	3.67E-04	5.84E-02	4.35E-05	5.47E-04	5.37E-05	2.58E-01	2.11E-02
GoldRule	30	1.27E+02	4.82E-02	3.52E-04	3.44E-02	3.15E-05	3.80E-01	3.48E-03	2.13E-04	4.38E-04	5.78E-03	1.18E-03	8.10E-02	1.43E-04	1.80E-03	1.73E-04	3.54E-01	3.50E-02
GoldRule	31	1.03E+02	3.94E-02	2.66E-04	2.78E-02	2.42E-05	3.11E-01	2.61E-03	1.59E-04	3.31E-04	4.74E-03	8.88E-04	6.62E-02	1.07E-04	1.34E-03	1.30E-04	2.90E-01	2.79E-02
GoldRule	32	5.59E+01	3.42E-02	1.34E-04	2.28E-02	1.23E-05	2.71E-01	1.32E-03	8.02E-05	1.67E-04	4.15E-03	4.47E-04	5.73E-02	5.36E-05	6.74E-04	6.55E-05	2.52E-01	2.14E-02
GoldRule	33	5.53E+01	3.54E-02	1.60E-04	2.39E-02	1.50E-05	2.80E-01	1.57E-03	9.55E-05	2.00E-04	4.29E-03	5.34E-04	5.93E-02	6.36E-05	7.98E-04	7.82E-05	2.61E-01	2.28E-02
GoldRule	34	1.17E+02	4.84E-02	3.24E-04	3.42E-02	2.84E-05	3.82E-01	3.22E-03	1.97E-04	4.02E-04	5.82E-03	1.09E-03	8.14E-02	1.33E-04	1.67E-03	1.60E-04	3.56E-01	3.43E-02
GoldRule	35	8.38E+01	3.67E-02	2.13E-04	2.55E-02	1.92E-05	2.90E-01	2.10E-03	1.28E-04	2.65E-04	4.43E-03	7.14E-04	6.17E-02	8.64E-05	1.09E-03	1.05E-04	2.70E-01	2.50E-02
GoldRule	36	4.51E+01	3.47E-02	1.15E-04	2.29E-02	1.08E-05	2.75E-01	1.13E-03	6.87E-05	1.44E-04	4.22E-03	3.84E-04	5.80E-02	4.57E-05	5.74E-04	5.62E-05	2.56E-01	2.11E-02
GoldRule	37	7.88E+01	3.66E-02	2.30E-04	2.55E-02	2.11E-05	2.89E-01	2.26E-03	1.38E-04	2.86E-04	4.40E-03	7.67E-04	6.13E-02	9.21E-05	1.16E-03	1.12E-04	2.69E-01	2.54E-02
Max		***1.27E+02***	***4.97E-02***	***3.52E-04***	***3.53E-02***	***3.18E-05***	***3.93E-01***	***3.48E-03***	***2.13E-04***	***4.38E-04***	***5.98E-03***	***1.18E-03***	***8.36E-02***	***1.43E-04***	***1.80E-03***	***1.73E-04***	***3.65E-01***	***3.57E-02***
BBRes	38	5.98E+02	1.66E-01	1.75E-03	1.25E-01	1.64E-04	1.31E+00	1.71E-02	1.04E-03	2.18E-03	1.97E-02	5.83E-03	2.80E-01	6.93E-04	8.71E-03	8.53E-04	1.21E+00	1.36E-01

Sensitive Receptor Name	Rec. No.	X/Q (ug/m3)	Total Concentration (ug/m3)															
			Benzene	Carbon Disulfide	Ethyl Benzene	Ethyl Chloride	Formaldehyde	Hexane	Methyl Bromide	Methyl Chloride	Methyl Chloroform	Methyl Ethyl Ketone	Naphthalene	Perchloroethylene	Phenol	Styrene	Toluene	Xylene
BBRes	39	5.58E+02	1.67E-01	1.82E-03	1.27E-01	1.70E-04	1.31E+00	1.79E-02	1.09E-03	2.28E-03	1.98E-02	6.07E-03	2.80E-01	7.23E-04	9.09E-03	8.89E-04	1.22E+00	1.38E-01
BBRes	40	5.95E+02	2.99E-01	1.98E-03	2.10E-01	1.84E-04	2.36E+00	1.94E-02	1.18E-03	2.47E-03	3.59E-02	6.59E-03	4.99E-01	7.86E-04	9.87E-03	9.65E-04	2.19E+00	2.10E-01
BBRes	41	6.18E+02	2.96E-01	2.06E-03	2.10E-01	1.92E-04	2.34E+00	2.02E-02	1.23E-03	2.57E-03	3.56E-02	6.87E-03	4.96E-01	8.20E-04	1.03E-02	1.01E-03	2.18E+00	2.12E-01
BBRes	42	6.66E+02	2.03E-01	2.24E-03	1.55E-01	2.08E-04	1.60E+00	2.20E-02	1.34E-03	2.80E-03	2.41E-02	7.47E-03	3.41E-01	8.93E-04	1.12E-02	1.09E-03	1.48E+00	1.69E-01
BBRes	43	6.74E+02	1.07E-01	2.21E-03	9.73E-02	1.74E-04	8.26E-01	2.23E-02	1.37E-03	2.71E-03	1.22E-02	7.53E-03	1.82E-01	9.56E-04	1.20E-02	1.11E-03	7.67E-01	1.21E-01
BBRes	44	4.26E+02	8.28E-02	1.63E-03	7.61E-02	1.04E-04	6.35E-01	1.71E-02	1.06E-03	1.98E-03	9.47E-03	5.71E-03	1.40E-01	7.70E-04	9.67E-03	8.42E-04	5.94E-01	9.38E-02
BBRes	45	2.07E+02	7.88E-02	7.40E-04	6.00E-02	4.55E-05	6.16E-01	7.78E-03	4.84E-04	8.94E-04	9.37E-03	2.60E-03	1.33E-01	3.53E-04	4.44E-03	3.83E-04	5.76E-01	6.38E-02
BBRes	46	2.26E+02	7.70E-02	8.35E-04	6.06E-02	4.87E-05	5.99E-01	8.84E-03	5.51E-04	1.01E-03	9.10E-03	2.95E-03	1.30E-01	4.05E-04	5.09E-03	4.35E-04	5.61E-01	6.61E-02
BBRes	47	2.11E+02	7.29E-02	7.36E-04	5.61E-02	4.79E-05	5.69E-01	7.68E-03	4.77E-04	8.94E-04	8.64E-03	2.57E-03	1.23E-01	3.45E-04	4.33E-03	3.79E-04	5.32E-01	6.04E-02
BBRes	48	5.13E+02	3.15E-01	1.68E-03	2.16E-01	1.57E-04	2.49E+00	1.64E-02	9.97E-04	2.09E-03	3.81E-02	5.58E-03	5.27E-01	6.63E-04	8.33E-03	8.17E-04	2.32E+00	2.10E-01
BBRes	49	5.61E+02	3.91E-01	1.84E-03	2.65E-01	1.72E-04	3.10E+00	1.80E-02	1.10E-03	2.30E-03	4.74E-02	6.13E-03	6.54E-01	7.30E-04	9.17E-03	8.98E-04	2.89E+00	2.54E-01
BBRes	50	5.80E+02	4.20E-01	1.91E-03	2.83E-01	1.78E-04	3.32E+00	1.87E-02	1.14E-03	2.38E-03	5.09E-02	6.35E-03	7.01E-01	7.57E-04	9.52E-03	9.30E-04	3.10E+00	2.70E-01
BBRes	51	6.29E+02	4.52E-01	2.06E-03	3.05E-01	1.92E-04	3.57E+00	2.02E-02	1.23E-03	2.57E-03	5.47E-02	6.87E-03	7.54E-01	8.20E-04	1.03E-02	1.01E-03	3.33E+00	2.91E-01
BBRes	52	6.33E+02	3.17E-01	2.13E-03	2.24E-01	1.85E-04	2.50E+00	2.12E-02	1.30E-03	2.64E-03	3.81E-02	7.18E-03	5.30E-01	8.82E-04	1.11E-02	1.05E-03	2.33E+00	2.25E-01
BBRes	53	7.65E+02	1.55E-01	2.33E-03	1.26E-01	2.16E-04	1.22E+00	2.29E-02	1.39E-03	2.91E-03	1.82E-02	7.78E-03	2.62E-01	9.31E-04	1.17E-02	1.14E-03	1.13E+00	1.47E-01
BBRes	54	8.00E+02	1.53E-01	2.42E-03	1.26E-01	2.16E-04	1.19E+00	2.39E-02	1.46E-03	3.01E-03	1.78E-02	8.11E-03	2.58E-01	9.85E-04	1.24E-02	1.19E-03	1.10E+00	1.49E-01
BBRes	55	4.49E+02	6.43E-02	1.74E-03	6.65E-02	1.10E-04	4.86E-01	1.82E-02	1.13E-03	2.10E-03	7.15E-03	6.08E-03	1.09E-01	8.22E-04	1.03E-02	8.97E-04	4.56E-01	8.77E-02
BBRes	56	1.57E+02	5.79E-02	5.33E-04	4.36E-02	3.71E-05	4.53E-01	5.50E-03	3.41E-04	6.49E-04	6.90E-03	1.85E-03	9.74E-02	2.43E-04	3.06E-03	2.72E-04	4.24E-01	4.62E-02
BBRes	57	9.92E+01	5.44E-02	3.15E-04	3.80E-02	2.45E-05	4.29E-01	3.20E-03	1.97E-04	3.87E-04	6.56E-03	1.08E-03	9.11E-02	1.38E-04	1.73E-03	1.58E-04	4.00E-01	3.74E-02
BBRes	58	4.99E+02	3.68E-01	1.66E-03	2.48E-01	1.49E-04	2.91E+00	1.64E-02	1.00E-03	2.06E-03	4.46E-02	5.56E-03	6.14E-01	6.74E-04	8.46E-03	8.15E-04	2.71E+00	2.37E-01
BBRes	59	5.31E+02	3.76E-01	1.75E-03	2.55E-01	1.61E-04	2.97E+00	1.72E-02	1.05E-03	2.19E-03	4.55E-02	5.86E-03	6.28E-01	7.03E-04	8.84E-03	8.58E-04	2.77E+00	2.44E-01
BBRes	60	5.79E+02	3.83E-01	1.92E-03	2.61E-01	1.79E-04	3.03E+00	1.88E-02	1.15E-03	2.40E-03	4.64E-02	6.40E-03	6.40E-01	7.63E-04	9.59E-03	9.38E-04	2.83E+00	2.52E-01
BBRes	61	6.09E+02	4.15E-01	2.03E-03	2.82E-01	1.89E-04	3.29E+00	1.99E-02	1.21E-03	2.53E-03	5.03E-02	6.76E-03	6.94E-01	8.06E-04	1.01E-02	9.90E-04	3.06E+00	2.72E-01
BBRes	62	6.47E+02	4.71E-01	2.12E-03	3.18E-01	1.97E-04	3.73E+00	2.08E-02	1.26E-03	2.64E-03	5.71E-02	7.06E-03	7.87E-01	8.44E-04	1.06E-02	1.03E-03	3.48E+00	3.03E-01
BBRes	63	6.77E+02	2.46E-01	2.25E-03	1.81E-01	2.09E-04	1.94E+00	2.21E-02	1.35E-03	2.81E-03	2.94E-02	7.51E-03	4.12E-01	8.98E-04	1.13E-02	1.10E-03	1.80E+00	1.91E-01
BBRes	64	8.07E+02	1.54E-01	2.43E-03	1.27E-01	2.24E-04	1.21E+00	2.38E-02	1.45E-03	3.03E-03	1.80E-02	8.10E-03	2.61E-01	9.71E-04	1.22E-02	1.19E-03	1.12E+00	1.49E-01
BBRes	65	8.15E+02	1.47E-01	2.50E-03	1.25E-01	2.14E-04	1.15E+00	2.49E-02	1.53E-03	3.10E-03	1.71E-02	8.44E-03	2.50E-01	1.04E-03	1.31E-02	1.24E-03	1.06E+00	1.49E-01
BBRes	66	3.32E+02	6.27E-02	1.29E-03	5.92E-02	7.30E-05	4.78E-01	1.37E-02	8.55E-04	1.55E-03	7.14E-03	4.56E-03	1.06E-01	6.31E-04	7.93E-03	6.73E-04	4.50E-01	7.35E-02
BBRes	67	9.66E+01	5.11E-02	3.09E-04	3.59E-02	2.39E-05	4.03E-01	3.13E-03	1.93E-04	3.79E-04	6.16E-03	1.06E-03	8.57E-02	1.35E-04	1.69E-03	1.55E-04	3.76E-01	3.55E-02
BBRes	68	5.06E+02	3.12E-01	1.69E-03	2.14E-01	1.59E-04	2.46E+00	1.65E-02	1.01E-03	2.11E-03	3.76E-02	5.62E-03	5.20E-01	6.69E-04	8.40E-03	8.24E-04	2.29E+00	2.08E-01
BBRes	69	5.24E+02	3.23E-01	1.76E-03	2.22E-01	1.65E-04	2.55E+00	1.72E-02	1.05E-03	2.20E-03	3.90E-02	5.86E-03	5.40E-01	6.97E-04	8.76E-03	8.58E-04	2.38E+00	2.16E-01
BBRes	70	5.56E+02	3.62E-01	1.83E-03	2.47E-01	1.71E-04	2.86E+00	1.79E-02	1.09E-03	2.29E-03	4.38E-02	6.10E-03	6.04E-01	7.27E-04	9.13E-03	8.93E-04	2.67E+00	2.38E-01
BBRes	71	6.00E+02	4.05E-01	1.98E-03	2.75E-01	1.85E-04	3.20E+00	1.94E-02	1.18E-03	2.47E-03	4.90E-02	6.60E-03	6.76E-01	7.87E-04	9.88E-03	9.66E-04	2.98E+00	2.65E-01
BBRes	72	6.45E+02	4.61E-01	2.12E-03	3.12E-01	1.97E-04	3.65E+00	2.08E-02	1.26E-03	2.64E-03	5.58E-02	7.06E-03	7.70E-01	8.43E-04	1.06E-02	1.03E-03	3.40E+00	2.98E-01
BBRes	73	6.62E+02	3.44E-01	2.20E-03	2.42E-01	1.94E-04	2.72E+00	2.18E-02	1.33E-03	2.73E-03	4.15E-02	7.38E-03	5.76E-01	9.01E-04	1.13E-02	1.08E-03	2.53E+00	2.41E-01
BBRes	74	7.21E+02	1.57E-01	2.22E-03	1.26E-01	2.05E-04	1.23E+00	2.18E-02	1.33E-03	2.77E-03	1.84E-02	7.41E-03	2.64E-01	8.87E-04	1.11E-02	1.08E-03	1.14E+00	1.45E-01
BBRes	75	6.60E+02	8.92E-02	2.24E-03	8.76E-02	1.67E-04	6.83E-01	2.29E-02	1.41E-03	2.75E-03	1.00E-02	7.71E-03	1.52E-01	9.96E-04	1.25E-02	1.13E-03	6.35E-01	1.14E-01
BBRes	76	1.61E+02	5.03E-02	5.53E-04	3.92E-02	3.85E-05	3.93E-01	5.71E-03	3.53E-04	6.73E-04	5.95E-03	1.91E-03	8.47E-02	2.52E-04	3.17E-03	2.82E-04	3.67E-01	4.29E-02
BBRes	77	7.67E+01	4.61E-02	2.36E-04	3.18E-02	1.80E-05	3.64E-01	2.40E-03	1.48E-04	2.89E-04	5.58E-03	8.07E-04	7.73E-02	1.04E-04	1.30E-03	1.19E-04	3.40E-01	3.08E-02
BBRes	78	4.99E+02	3.22E-01	1.65E-03	2.20E-01	1.55E-04	2.54E+00	1.62E-02	9.84E-04	2.07E-03	3.89E-02	5.50E-03	5.37E-01	6.54E-04	8.22E-03	8.06E-04	2.37E+00	2.13E-01
BBRes	79	5.24E+02	3.32E-01	1.75E-03	2.27E-01	1.64E-04	2.63E+00	1.71E-02	1.04E-03	2.18E-03	4.02E-02	5.83E-03	5.55E-01	6.93E-04	8.71E-03	8.53E-04	2.45E+00	2.21E-01
BBRes	80	5.39E+02	3.77E-01	1.79E-03	2.56E-01	1.59E-04	2.98E+00	1.77E-02	1.08E-03	2.22E-03	4.57E-02	6.00E-03	6.30E-01	7.29E-04	9.15E-03	8.79E-04	2.78E+00	2.46E-01
BBRes	81	5.54E+02	4.24E-01	1.77E-03	2.85E-01	1.58E-04	3.36E+00	1.76E-02	1.07E-03	2.20E-03	5.15E-02	5.95E-03	7.09E-01	7.24E-04	9.10E-03	8.73E-04	3.13E+00	2.69E-01
BBRes	82	6.16E+02	4.38E-01	2.05E-03	2.96E-01	1.90E-04	3.47E+00	2.01E-02	1.22E-03	2.55E-03	5.31E-02	6.82E-03	7.31E-01	8.14E-04	1.02E-02	9.98E-04	3.23E+00	2.84E-01
BBRes	83	6.56E+02	3.60E-01	2.19E-03	2.50E-01	2.03E-04	2.84E+00	2.15E-02	1.31E-03	2.73E-03	4.33E-02	7.30E-03	6.01E-01	8.72E-04	1.10E-02	1.07E-03	2.65E+00	2.48E-01
BBRes	84	7.17E+02	1.79E-01	2.35E-03	1.41E-01	2.18E-04	1.40E+00	2.31E-02	1.40E-03	2.93E-03	2.10E-02	7.84E-03	3.01E-01	9.38E-04	1.18E-02	1.15E-03	1.30E+00	1.60E-01
BBRes	85	5.84E+02	7.58E-02	2.07E-03	7.74E-02	1.48E-04	5.76E-01	2.13E-02	1.32E-03	2.53E-03	8.43E-03	7.16E-03	1.29E-01	9.38E-04	1.18E-02	1.05E-03	5.37E-01	1.03E-01
BBRes	86	1.01E+02	5.43E-02	3.19E-04	3.80E-02	2.53E-05	4.28E-01	3.23E-03	1.99E-04	3.93E-04	6.54E-03	1.09E-03	9.10E-02	1.38E-04	1.74E-03	1.60E-04	3.99E-01	3.74E-02
BBRes	87	1.02E+02	6.55E-02	3.17E-04	4.49E-02	2.50E-05	5.18E-01	3.21E-03	1.97E-04	3.90E-04	7.93E-03	1.08E-03	1.10E-01	1.37E-04	1.73E-03	1.59E-04	4.83E-01	4.32E-02
BBRes	88	4.82E+02	3.61E-01	1.57E-03	2.43E-01	1.40E-04	2.86E+00	1.55E-02	9.43E-04	1.95E-03	4.38E-02	5.25E-03	6.03E-01	6.36E-04	7.99E-03	7.69E-04	2.67E+00	2.31E-01
BBRes	89	4.70E+02	3.62E-01	1.53E-03	2.43E-01	1.43E-04	2.87E+00	1.50E-02	9.10E-04	1.91E-03	4.40E-02	5.09E-03	6.05E-01	6.05E-04	7.60E-03	7.45E-04	2.68E+00	2.30E-01

Sensitive Receptor Name	Rec. No.	X/Q (ug/m3)	Total Concentration (ug/m3)															
			Benzene	Carbon Disulfide	Ethyl Benzene	Ethyl Chloride	Formaldehyde	Hexane	Methyl Bromide	Methyl Chloride	Methyl Chloroform	Methyl Ethyl Ketone	Naphthalene	Perchloroethylene	Phenol	Styrene	Toluene	Xylene
BBRes	90	5.48E+02	3.81E-01	1.81E-03	2.58E-01	1.69E-04	3.02E+00	1.77E-02	1.08E-03	2.26E-03	4.62E-02	6.02E-03	6.37E-01	7.17E-04	9.01E-03	8.82E-04	2.81E+00	2.48E-01
BBRes	91	5.82E+02	4.20E-01	1.91E-03	2.83E-01	1.79E-04	3.32E+00	1.87E-02	1.14E-03	2.39E-03	5.09E-02	6.37E-03	7.01E-01	7.59E-04	9.54E-03	9.33E-04	3.10E+00	2.70E-01
BBRes	92	6.79E+02	1.67E-01	2.02E-03	1.29E-01	1.88E-04	1.31E+00	1.98E-02	1.21E-03	2.52E-03	1.97E-02	6.74E-03	2.81E-01	8.04E-04	1.01E-02	9.87E-04	1.22E+00	1.44E-01
BBRes	93	6.54E+02	1.63E-01	2.13E-03	1.28E-01	1.98E-04	1.28E+00	2.09E-02	1.27E-03	2.65E-03	1.92E-02	7.09E-03	2.74E-01	8.46E-04	1.06E-02	1.04E-03	1.18E+00	1.45E-01
BBRes	94	7.36E+02	1.71E-01	2.18E-03	1.34E-01	1.99E-04	1.34E+00	2.15E-02	1.31E-03	2.72E-03	2.01E-02	7.30E-03	2.88E-01	8.79E-04	1.10E-02	1.07E-03	1.24E+00	1.51E-01
BBRes	95	3.42E+02	6.30E-02	1.34E-03	5.96E-02	8.23E-05	4.81E-01	1.41E-02	8.75E-04	1.62E-03	7.16E-03	4.69E-03	1.07E-01	6.38E-04	8.02E-03	6.92E-04	4.51E-01	7.46E-02
BBRes	96	9.69E+01	7.50E-02	2.97E-04	5.04E-02	2.38E-05	5.93E-01	3.00E-03	1.84E-04	3.65E-04	9.10E-03	1.01E-03	1.25E-01	1.28E-04	1.60E-03	1.48E-04	5.54E-01	4.74E-02
BBRes	97	1.46E+02	7.34E-02	4.89E-04	5.25E-02	3.43E-05	5.77E-01	5.05E-03	3.12E-04	5.96E-04	8.82E-03	1.69E-03	1.23E-01	2.23E-04	2.80E-03	2.49E-04	5.40E-01	5.28E-02
BBRes	98	4.82E+02	1.75E-01	1.57E-03	1.28E-01	1.48E-04	1.38E+00	1.53E-02	9.32E-04	1.96E-03	2.09E-02	5.22E-03	2.93E-01	6.19E-04	7.78E-03	7.64E-04	1.28E+00	1.35E-01
BBRes	99	5.08E+02	3.21E-01	1.66E-03	2.20E-01	1.56E-04	2.54E+00	1.63E-02	9.89E-04	2.08E-03	3.89E-02	5.53E-03	5.37E-01	6.57E-04	8.26E-03	8.10E-04	2.37E+00	2.13E-01
BBRes	100	5.30E+02	2.67E-01	1.75E-03	1.87E-01	1.64E-04	2.11E+00	1.72E-02	1.04E-03	2.19E-03	3.21E-02	5.84E-03	4.46E-01	6.94E-04	8.72E-03	8.54E-04	1.96E+00	1.87E-01
BBRes	101	5.58E+02	2.87E-01	1.84E-03	2.01E-01	1.72E-04	2.27E+00	1.80E-02	1.10E-03	2.30E-03	3.46E-02	6.13E-03	4.80E-01	7.30E-04	9.17E-03	8.98E-04	2.11E+00	2.00E-01
BBRes	102	6.53E+02	1.76E-01	1.91E-03	1.33E-01	1.77E-04	1.38E+00	1.87E-02	1.14E-03	2.38E-03	2.08E-02	6.37E-03	2.96E-01	7.61E-04	9.56E-03	9.33E-04	1.28E+00	1.45E-01
BBRes	103	6.02E+02	1.10E-01	1.90E-03	9.44E-02	1.55E-04	8.54E-01	1.92E-02	1.18E-03	2.35E-03	1.27E-02	6.47E-03	1.86E-01	8.13E-04	1.02E-02	9.50E-04	7.92E-01	1.13E-01
BBRes	104	4.43E+02	7.27E-02	1.63E-03	6.93E-02	1.12E-04	5.56E-01	1.69E-02	1.05E-03	1.98E-03	8.23E-03	5.66E-03	1.23E-01	7.49E-04	9.41E-03	8.34E-04	5.19E-01	8.78E-02
BBRes	105	1.19E+02	7.87E-02	3.84E-04	5.41E-02	2.79E-05	6.21E-01	3.94E-03	2.43E-04	4.69E-04	9.52E-03	1.32E-03	1.32E-01	1.72E-04	2.17E-03	1.95E-04	5.81E-01	5.21E-02
BBRes	106	1.19E+02	7.87E-02	3.76E-04	5.39E-02	2.86E-05	6.21E-01	3.83E-03	2.36E-04	4.61E-04	9.52E-03	1.29E-03	1.32E-01	1.66E-04	2.08E-03	1.90E-04	5.80E-01	5.18E-02
BBRes	107	1.97E+02	6.91E-02	7.54E-04	5.47E-02	4.15E-05	5.37E-01	8.04E-03	5.03E-04	9.06E-04	8.16E-03	2.68E-03	1.16E-01	3.72E-04	4.68E-03	3.95E-04	5.04E-01	5.97E-02
BBRes	108	3.69E+02	8.00E-02	1.24E-03	6.73E-02	9.27E-05	6.22E-01	1.27E-02	7.81E-04	1.52E-03	9.32E-03	4.26E-03	1.35E-01	5.50E-04	6.91E-03	6.27E-04	5.79E-01	7.88E-02
BBRes	109	5.27E+02	1.44E-01	1.55E-03	1.10E-01	1.36E-04	1.13E+00	1.54E-02	9.41E-04	1.92E-03	1.71E-02	5.22E-03	2.42E-01	6.39E-04	8.02E-03	7.65E-04	1.05E+00	1.19E-01
BBRes	110	5.66E+02	1.79E-01	1.65E-03	1.32E-01	1.48E-04	1.41E+00	1.63E-02	9.94E-04	2.05E-03	2.14E-02	5.53E-03	3.01E-01	6.70E-04	8.42E-03	8.11E-04	1.31E+00	1.40E-01
BBRes	111	5.76E+02	1.48E-01	1.69E-03	1.14E-01	1.48E-04	1.16E+00	1.68E-02	1.03E-03	2.10E-03	1.75E-02	5.69E-03	2.50E-01	6.96E-04	8.75E-03	8.35E-04	1.08E+00	1.26E-01
BBRes	112	3.48E+02	7.31E-02	1.28E-03	6.43E-02	8.66E-05	5.64E-01	1.32E-02	8.21E-04	1.55E-03	8.44E-03	4.44E-03	1.23E-01	5.89E-04	7.40E-03	6.53E-04	5.27E-01	7.72E-02
BBRes	113	1.57E+02	7.85E-02	5.50E-04	5.67E-02	3.69E-05	6.17E-01	5.71E-03	3.54E-04	6.68E-04	9.42E-03	1.91E-03	1.32E-01	2.55E-04	3.20E-03	2.82E-04	5.77E-01	5.74E-02
BBRes	114	1.87E+02	8.02E-02	6.79E-04	5.98E-02	4.33E-05	6.28E-01	7.10E-03	4.42E-04	8.23E-04	9.57E-03	2.38E-03	1.35E-01	3.20E-04	4.02E-03	3.50E-04	5.88E-01	6.25E-02
BBRes	115	1.17E+02	7.89E-02	3.69E-04	5.39E-02	2.74E-05	6.23E-01	3.77E-03	2.33E-04	4.51E-04	9.55E-03	1.27E-03	1.32E-01	1.64E-04	2.06E-03	1.86E-04	5.82E-01	5.17E-02
BBRes	116	1.39E+02	6.93E-02	4.71E-04	4.97E-02	3.26E-05	5.45E-01	4.87E-03	3.02E-04	5.74E-04	8.33E-03	1.63E-03	1.16E-01	2.16E-04	2.71E-03	2.40E-04	5.09E-01	5.01E-02
BBRes	117	2.77E+02	6.52E-02	1.07E-03	5.71E-02	6.23E-05	5.02E-01	1.14E-02	7.09E-04	1.29E-03	7.54E-03	3.78E-03	1.10E-01	5.21E-04	6.55E-03	5.59E-04	4.71E-01	6.77E-02
BBRes	118	3.73E+02	6.85E-02	1.24E-03	6.02E-02	9.42E-05	5.30E-01	1.27E-02	7.81E-04	1.52E-03	7.89E-03	4.26E-03	1.16E-01	5.49E-04	6.89E-03	6.27E-04	4.93E-01	7.29E-02
BBRes	119	3.18E+02	6.41E-02	1.12E-03	5.62E-02	7.91E-05	4.95E-01	1.16E-02	7.15E-04	1.37E-03	7.40E-03	3.88E-03	1.08E-01	5.09E-04	6.40E-03	5.71E-04	4.62E-01	6.75E-02
BBRes	120	1.72E+02	7.15E-02	6.32E-04	5.38E-02	3.95E-05	5.60E-01	6.63E-03	4.12E-04	7.64E-04	8.53E-03	2.21E-03	1.20E-01	3.00E-04	3.77E-03	3.27E-04	5.24E-01	5.66E-02
BBRes	121	1.55E+02	7.82E-02	5.51E-04	5.66E-02	3.62E-05	6.14E-01	5.74E-03	3.56E-04	6.69E-04	9.39E-03	1.92E-03	1.31E-01	2.57E-04	3.23E-03	2.83E-04	5.75E-01	5.74E-02
BBRes	122	1.27E+02	8.25E-02	4.15E-04	5.69E-02	3.00E-05	6.50E-01	4.26E-03	2.63E-04	5.07E-04	9.97E-03	1.43E-03	1.38E-01	1.87E-04	2.35E-03	2.11E-04	6.08E-01	5.50E-02
BBRes	123	1.24E+02	8.23E-02	3.99E-04	5.66E-02	2.79E-05	6.49E-01	4.12E-03	2.55E-04	4.86E-04	9.95E-03	1.38E-03	1.38E-01	1.82E-04	2.29E-03	2.03E-04	6.07E-01	5.45E-02
BBRes	124	1.14E+02	7.75E-02	3.77E-04	5.34E-02	2.58E-05	6.11E-01	3.91E-03	2.42E-04	4.59E-04	9.37E-03	1.31E-03	1.30E-01	1.74E-04	2.18E-03	1.93E-04	5.71E-01	5.15E-02
BBRes	125	1.25E+02	6.73E-02	4.12E-04	4.75E-02	2.96E-05	5.29E-01	4.23E-03	2.62E-04	5.03E-04	8.10E-03	1.42E-03	1.13E-01	1.86E-04	2.33E-03	2.09E-04	4.95E-01	4.71E-02
BBRes	126	1.51E+02	6.21E-02	5.08E-04	4.58E-02	3.58E-05	4.87E-01	5.24E-03	3.24E-04	6.20E-04	7.42E-03	1.76E-03	1.04E-01	2.31E-04	2.90E-03	2.59E-04	4.55E-01	4.75E-02
BBRes	127	3.43E+02	6.63E-02	1.33E-03	6.16E-02	8.24E-05	5.07E-01	1.40E-02	8.72E-04	1.61E-03	7.57E-03	4.68E-03	1.12E-01	6.35E-04	7.98E-03	6.90E-04	4.76E-01	7.61E-02
BBRes	128	4.50E+02	2.15E-01	1.49E-03	1.52E-01	1.41E-04	1.70E+00	1.45E-02	8.82E-04	1.86E-03	2.58E-02	4.94E-03	3.59E-01	5.85E-04	7.35E-03	7.23E-04	1.58E+00	1.53E-01
BBRes	129	4.67E+02	1.83E-01	1.55E-03	1.33E-01	1.46E-04	1.45E+00	1.51E-02	9.21E-04	1.94E-03	2.19E-02	5.15E-03	3.07E-01	6.11E-04	7.68E-03	7.54E-04	1.34E+00	1.39E-01
BBRes	130	5.17E+02	1.38E-01	1.53E-03	1.06E-01	1.32E-04	1.08E+00	1.52E-02	9.31E-04	1.90E-03	1.64E-02	5.15E-03	2.33E-01	6.34E-04	7.96E-03	7.56E-04	1.01E+00	1.16E-01
BBRes	131	3.39E+02	8.38E-02	1.19E-03	6.94E-02	8.37E-05	6.51E-01	1.23E-02	7.60E-04	1.45E-03	9.80E-03	4.12E-03	1.41E-01	5.42E-04	6.81E-03	6.07E-04	6.08E-01	7.97E-02
BBRes	132	3.87E+02	8.17E-02	1.37E-03	7.06E-02	9.80E-05	6.32E-01	1.41E-02	8.70E-04	1.67E-03	9.46E-03	4.73E-03	1.38E-01	6.18E-04	7.77E-03	6.96E-04	5.90E-01	8.40E-02
BBRes	133	4.64E+02	8.25E-02	1.57E-03	7.37E-02	1.18E-04	6.37E-01	1.61E-02	9.92E-04	1.93E-03	9.47E-03	5.41E-03	1.40E-01	6.99E-04	8.78E-03	7.96E-04	5.93E-01	9.03E-02
BBRes	134	2.10E+02	6.50E-02	7.92E-04	5.24E-02	4.79E-05	5.05E-01	8.35E-03	5.20E-04	9.57E-04	7.65E-03	2.79E-03	1.09E-01	3.81E-04	4.78E-03	4.11E-04	4.73E-01	5.85E-02
BBRes	135	2.61E+02	6.58E-02	9.98E-04	5.61E-02	6.13E-05	5.08E-01	1.05E-02	6.54E-04	1.21E-03	7.66E-03	3.51E-03	1.11E-01	4.77E-04	5.99E-03	5.17E-04	4.76E-01	6.54E-02
BBRes	136	2.45E+02	6.28E-02	9.54E-04	5.37E-02	5.69E-05	4.85E-01	1.01E-02	6.28E-04	1.15E-03	7.30E-03	3.36E-03	1.06E-01	4.60E-04	5.78E-03	4.96E-04	4.55E-01	6.26E-02
BBRes	137	5.03E+02	7.33E-02	1.82E-03	7.22E-02	1.27E-04	5.59E-01	1.87E-02	1.16E-03	2.21E-03	8.23E-03	6.29E-03	1.25E-01	8.27E-04	1.04E-02	9.26E-04	5.21E-01	9.37E-02
Max		***8.15E+02***	***4.71E-01***	***2.50E-03***	***3.18E-01***	***2.24E-04***	***3.73E+00***	***2.49E-02***	***1.53E-03***	***3.10E-03***	***5.71E-02***	***8.44E-03***	***7.87E-01***	***1.04E-03***	***1.31E-02***	***1.24E-03***	***3.48E+00***	***3.03E-01***

Proposed Harris Quarry Project
Odor Evaluation Calculations

Black Bart Residents

Chemical	Molecular Weight (lb/lb-mole)	Odor Threshold (ppm)	Odor Threshold (ug/m3)	Maximum Modeled 1-Hour Concentration (ug/m3)	Maximum Modeled 1-Hour Concentration (ppm)	5-Minute Average (ppm)	Exceeds Odor Threshold?
Benzene	78.11	1.5	4.87E+03	4.71E-01	0.0001	2.38E-04	No
Carbon Disulfide	76.14	0.016	5.07E+01	2.50E-03	0.0000	1.30E-06	No
Ethyl Benzene	106.16	2.3	1.02E+04	3.18E-01	0.0001	1.18E-04	No
Ethyl Chloride	64.52	4.2	1.13E+04	2.24E-04	0.0000	1.37E-07	No
Formaldehyde	30.03	0.83	1.04E+03	3.73E+00	0.0030	4.91E-03	No
Hexane	86.17	130	4.66E+05	2.49E-02	0.0000	1.14E-05	No
Methyl Bromide	94.95	20.5	8.10E+04	1.53E-03	0.0000	6.35E-07	No
Methyl Chloride	50.49	10	2.10E+04	3.10E-03	0.0000	2.42E-06	No
Methyl Chloroform	133.42	120	6.66E+05	5.71E-02	0.0000	1.69E-05	No
Methyl Ethyl Ketone	100.16	0.1	4.17E+02	8.44E-03	0.0000	3.33E-06	No
Naphthalene	128.19	0.084	4.48E+02	7.87E-01	0.0001	2.43E-04	No
Perchloroethylene	165.83	1	6.90E+03	1.04E-03	0.0000	2.48E-07	No
Phenol	94.1	0.04	1.57E+02	1.31E-02	0.0000	5.49E-06	No
Styrene	104.16	0.32	1.39E+03	1.24E-03	0.0000	4.70E-07	No
Toluene	92.15	2.9	1.11E+04	3.48E+00	0.0009	1.49E-03	No
Xylene	106.16	1.1	4.86E+03	3.03E-01	0.0001	1.13E-04	No

CDF Office Area

Chemical	Molecular Weight (lb/lb-mole)	Odor Threshold (ppm)	Odor Threshold (ug/m3)	Maximum Modeled 1-Hour Concentration (ug/m3)	Maximum Modeled 1-Hour Concentration (ppm)	5-Minute Average (ppm)	Exceeds Odor Threshold?
Benzene	78.11	1.5	4.87E+03	8.18E-02	2.52E-05	4.14E-05	No
Carbon Disulfide	76.14	0.016	5.07E+01	4.81E-04	1.52E-07	2.50E-07	No
Ethyl Benzene	106.16	2.3	1.02E+04	5.41E-02	1.22E-05	2.01E-05	No
Ethyl Chloride	64.52	4.2	1.13E+04	3.94E-05	1.47E-08	2.41E-08	No
Formaldehyde	30.03	0.83	1.04E+03	6.48E-01	5.19E-04	8.53E-04	No
Hexane	86.17	130	4.66E+05	4.84E-03	1.35E-06	2.22E-06	No
Methyl Bromide	94.95	20.5	8.10E+04	2.97E-04	7.52E-08	1.24E-07	No
Methyl Chloride	50.49	10	2.10E+04	5.94E-04	2.83E-07	4.65E-07	No
Methyl Chloroform	133.42	120	6.66E+05	9.96E-03	1.79E-06	2.95E-06	No
Methyl Ethyl Ketone	100.16	0.1	4.17E+02	1.63E-03	3.92E-07	6.45E-07	No
Naphthalene	128.19	0.084	4.48E+02	1.37E-01	2.57E-05	4.22E-05	No
Perchloroethylene	165.83	1	6.90E+03	2.05E-04	2.97E-08	4.89E-08	No
Phenol	94.1	0.04	1.57E+02	2.58E-03	6.58E-07	1.08E-06	No
Styrene	104.16	0.32	1.39E+03	2.40E-04	5.54E-08	9.11E-08	No
Toluene	92.15	2.9	1.11E+04	6.05E-01	1.58E-04	2.59E-04	No
Xylene	106.16	1.1	4.86E+03	5.32E-02	1.20E-05	1.98E-05	No

Highway 101 - Old Commercial Area

Chemical	Molecular Weight (lb/lb-mole)	Odor Threshold (ppm)	Odor Threshold (ug/m3)	Maximum Modeled 1-Hour Concentration (ug/m3)	Maximum Modeled 1-Hour Concentration (ppm)	5-Minute Average (ppm)	Exceeds Odor Threshold?
Benzene	78.11	1.5	4.87E+03	1.02E-01	3.13E-05	5.14E-05	No
Carbon Disulfide	76.14	0.016	5.07E+01	8.17E-03	2.58E-06	4.24E-06	No
Ethyl Benzene	106.16	2.3	1.02E+04	1.73E-01	3.91E-05	6.43E-05	No
Ethyl Chloride	64.52	4.2	1.13E+04	6.78E-04	2.53E-07	4.16E-07	No
Formaldehyde	30.03	0.83	1.04E+03	7.75E-01	6.20E-04	1.02E-03	No
Hexane	86.17	130	4.66E+05	8.19E-02	2.29E-05	3.76E-05	No
Methyl Bromide	94.95	20.5	8.10E+04	5.02E-03	1.27E-06	2.09E-06	No
Methyl Chloride	50.49	10	2.10E+04	1.01E-02	4.80E-06	7.90E-06	No
Methyl Chloroform	133.42	120	6.66E+05	1.10E-02	1.98E-06	3.26E-06	No
Methyl Ethyl Ketone	100.16	0.1	4.17E+02	2.77E-02	6.65E-06	1.09E-05	No
Naphthalene	128.19	0.084	4.48E+02	1.73E-01	3.25E-05	5.34E-05	No
Perchloroethylene	165.83	1	6.90E+03	3.46E-03	5.01E-07	8.24E-07	No
Phenol	94.1	0.04	1.57E+02	4.34E-02	1.11E-05	1.82E-05	No
Styrene	104.16	0.32	1.39E+03	4.07E-03	9.38E-07	1.54E-06	No
Toluene	92.15	2.9	1.11E+04	6.94E-01	1.81E-04	2.98E-04	No
Xylene	106.16	1.1	4.86E+03	2.92E-01	6.61E-05	1.09E-04	No

Golden Rule Mobile Village

Chemical	Molecular Weight (lb/lb-mole)	Odor Threshold (ppm)	Odor Threshold (ug/m3)	Maximum Modeled 1-Hour Concentration (ug/m3)	Maximum Modeled 1-Hour Concentration (ppm)	5-Minute Average (ppm)	Exceeds Odor Threshold?
Benzene	78.11	1.5	4.87E+03	9.06E-02	2.79E-05	4.58E-05	No
Carbon Disulfide	76.14	0.016	5.07E+01	2.18E-04	6.89E-08	1.13E-07	No
Ethyl Benzene	106.16	2.3	1.02E+04	5.81E-02	1.32E-05	2.16E-05	No
Ethyl Chloride	64.52	4.2	1.13E+04	2.02E-05	7.53E-09	1.24E-08	No
Formaldehyde	30.03	0.83	1.04E+03	7.19E-01	5.76E-04	9.46E-04	No
Hexane	86.17	130	4.66E+05	2.14E-03	5.98E-07	9.82E-07	No
Methyl Bromide	94.95	20.5	8.10E+04	1.30E-04	3.30E-08	5.43E-08	No
Methyl Chloride	50.49	10	2.10E+04	2.72E-04	1.30E-07	2.13E-07	No
Methyl Chloroform	133.42	120	6.66E+05	1.11E-02	2.00E-06	3.28E-06	No
Methyl Ethyl Ketone	100.16	0.1	4.17E+02	7.28E-04	1.75E-07	2.87E-07	No
Naphthalene	128.19	0.084	4.48E+02	1.51E-01	2.84E-05	4.67E-05	No
Perchloroethylene	165.83	1	6.90E+03	8.71E-05	1.26E-08	2.07E-08	No
Phenol	94.1	0.04	1.57E+02	1.09E-03	2.79E-07	4.59E-07	No
Styrene	104.16	0.32	1.39E+03	1.07E-04	2.46E-08	4.04E-08	No
Toluene	92.15	2.9	1.11E+04	6.71E-01	1.75E-04	2.88E-04	No
Xylene	106.16	1.1	4.86E+03	5.18E-02	1.17E-05	1.93E-05	No

Church of the Golden Rule

Chemical	Molecular Weight (lb/lb-mole)	Odor Threshold (ppm)	Odor Threshold (ug/m3)	Maximum Modeled 1-Hour Concentration (ug/m3)	Maximum Modeled 1-Hour Concentration (ppm)	5-Minute Average (ppm)	Exceeds Odor Threshold?
Benzene	78.11	1.5	4.87E+03	4.97E-02	1.53E-05	2.52E-05	No
Carbon Disulfide	76.14	0.016	5.07E+01	3.52E-04	1.11E-07	1.83E-07	No
Ethyl Benzene	106.16	2.3	1.02E+04	3.53E-02	8.00E-06	1.31E-05	No
Ethyl Chloride	64.52	4.2	1.13E+04	3.18E-05	1.19E-08	1.95E-08	No
Formaldehyde	30.03	0.83	1.04E+03	3.93E-01	3.14E-04	5.17E-04	No
Hexane	86.17	130	4.66E+05	3.48E-03	9.71E-07	1.60E-06	No
Methyl Bromide	94.95	20.5	8.10E+04	2.13E-04	5.38E-08	8.84E-08	No
Methyl Chloride	50.49	10	2.10E+04	4.38E-04	2.08E-07	3.43E-07	No
Methyl Chloroform	133.42	120	6.66E+05	5.98E-03	1.08E-06	1.77E-06	No
Methyl Ethyl Ketone	100.16	0.1	4.17E+02	1.18E-03	2.83E-07	4.66E-07	No
Naphthalene	128.19	0.084	4.48E+02	8.36E-02	1.57E-05	2.58E-05	No
Perchloroethylene	165.83	1	6.90E+03	1.43E-04	2.08E-08	3.42E-08	No
Phenol	94.1	0.04	1.57E+02	1.80E-03	4.60E-07	7.56E-07	No
Styrene	104.16	0.32	1.39E+03	1.73E-04	4.00E-08	6.57E-08	No
Toluene	92.15	2.9	1.11E+04	3.65E-01	9.53E-05	1.57E-04	No
Xylene	106.16	1.1	4.86E+03	3.57E-02	8.09E-06	1.33E-05	No

Meteorological Data Report

WILLITS METEOROLOGICAL DATA

prepared by

David Suder
Precise Environmental Consultants

T&B Systems (Santa Rosa, CA) operated a meteorological monitoring system in Willits, California from April 18, 2003 through July 25, 2005. The system was located at the site of the former Abex/Remco Hydraulics facility, 934 South Main Street.[1] The monitoring system included a low-threshold combined wind speed/wind direction sensor (R.M. Young model 05035AQ), a combined ambient temperature/dewpoint sensor (Vaisala model HMP35C) and a Kipp & Zonnen net radiation sensor. In compliance with U.S. Environmental Protection Agency recommendations for meteorological monitoring near buildings,[2] the wind sensors were mounted at 20 meters above grade (roughly 2.5 times the height of the adjacent rooftop and about 130 meters west of a higher portion of the plant roof).

The meteorological sensors were calibrated prior to installation, and at approximately six-month intervals thereafter. The collected data were remotely downloaded from the system frequently (about once per week), and the system was visited and checked by the site operator about once per month. The monitoring system was subjected to periodic performance audits, performed by personnel and equipment not involved in the routine operation of the system.

All collected data are considered valid except as noted in the data file. During the period October 15, 2003 – January 16, 2004, the wind direction data are flagged as "estimated" values due to a sensor misalignment problem during that period. The data have been corrected during that period, to the extent possible, based on available evidence (comparison of collected wind direction data with corresponding data collected one year later, a photograph of the sensor housing position during this period, and the observed rotation of the sensor housing at the time the problem was resolved in January 2004). Although the corrected wind direction data are believed to be accurate, compliance with the U.S. Environmental Protection Agency's recommended wind direction accuracy specification cannot be positively assured during this period. For this reason and others, the system was operated for another 18 months without significant problems after the wind sensor alignment was corrected.

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[1] UTM Coordinates: 469,523 m E , 4,361,513 m N (zone 10, NAD 83).

[2] 2000. *Meteorological Monitoring Guidance for Regulatory Modeling Applications*. Office of Air Quality Planning and Standards. EPA-454/R-99-005

For use in the ISCST3 dispersion model, the data collected at the Willits/Remco monitoring station were processed into the required format using the U.S. Environmental Protection Agency's Meteorological Processor for Regulatory Models (MPRM). In addition to reformatting the hourly data collected by the monitoring system, MPRM calculated hourly atmospheric stability categories using the sigma-A algorithm.[3] Hourly urban and rural mixing height values were calculated from seasonal average morning and afternoon mixing height data presented by Holzworth[4] using the EPA-recommended interpolation method.[5]

Figure 1 presents a wind rose created from the Willits wind direction and wind speed data for the one-year period 2/1/2004 – 1/31/2005. Wind roses created for other one- or two-year periods are very similar.

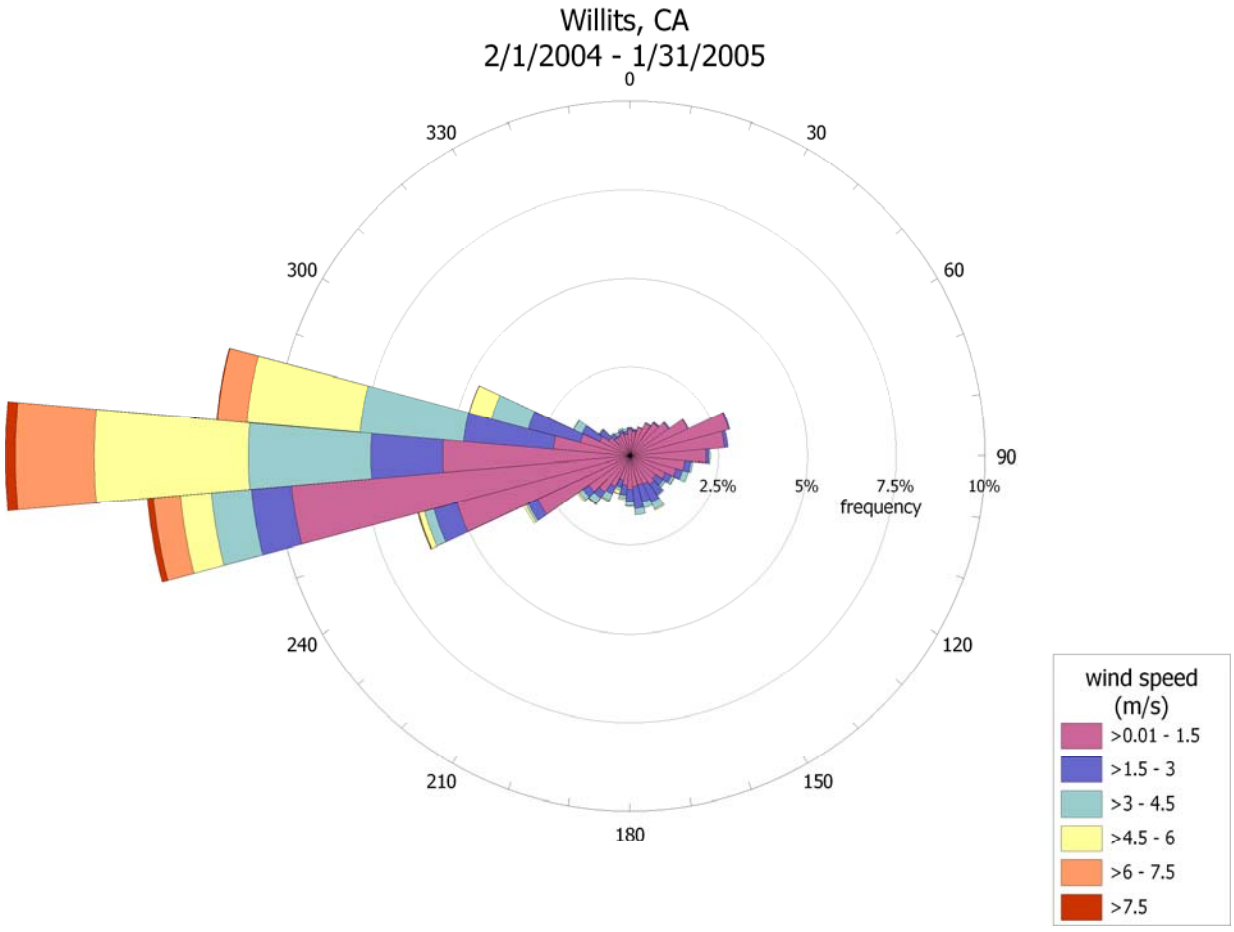
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[3] U.S. Environmental Protection Agency, 1996. *Meteorological Processor For Regulatory Models (MPRM) User's Guide*. EPA-454/B-96-002. pp. 4-11.

[4] Holzworth, G.A., 1972. Mixing Heights, Wind Speeds and Potential for Urban Air Pollution throughout the Contiguous United States. U.S. Environmental Protection Agency AP-101.

[5] U.S. Environmental Protection Agency, 1996. *Meteorological Processor For Regulatory Models (MPRM) User's Guide*. EPA-454/B-96-002. p. 4-12.

Figure 1


Willits, CA
2/1/2004 - 1/31/2005
0
30
60
90
120
150
180
210
240
300
330
2.5%
5%
7.5%
10%
frequency
wind speed
(m/s)
>0.01 - 1.5
>1.5 - 3
>3 - 4.5
>4.5 - 6
>6 - 7.5
>7.5