Letter 14

J. PHYLLIS FOX, Ph.D.

ENVIRONMENTAL MANAGEMENT

October 16, 2000

Jeff Swanson
2515 Park Marina Drive, Suite 102
Redding, CA 96001

Dear Mr. Swanson:

As you requested, I have reviewed the project description, air quality, hydrology and water quality, and noise sections of the Draft Environmental Impact Report ("DEIR") for the Eastside Aggregates Project ("project").[1] I also reviewed other files that you supplied, including those of the Shasta County Planning Department, the Shasta County Air Quality Management District ("SCAQMD"), and the Regional Water Quality Control Board ("RWQCB"). My resume is attached to these comments in Exhibit 34.

This review indicates that the capacity of the equipment that would be installed is substantially larger than the throughput evaluated in the DEIR. Both the project evaluated in the DEIR and the much larger project described in other agency files would result in a large number of significant impacts that were not identified in the DEIR. The project would result in significant public health impacts from diesel truck exhaust and crystalline silica in fugitive dusts. The project would also individually and cumulatively drawdown the water levels in nearby residential wells, dry up small springs, and significantly reduce the flow of larger springs, including those that provide habitat for the threatened and endangered Shasta crayfish. The project would also result in significant air quality and noise impacts. Finally, the mitigation measures proposed in the DEIR for air quality and noise impacts are not adequate to mitigate the significant impacts that were identified. The DEIR should be revised and recirculated for public review or the project denied.

My detailed comments are attached.

Very truly yours,

J. Phyllis Fox by MF

J. Phyllis Fox, Ph.D.

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[1] Pacific Mutual Consultants, Eastside Aggregates Project, Draft Environmental Impact Report, Prepared for Shasta County, Department of Resource Management, Planning Division, August 2000.

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COMMENTS ON
EASTSIDE AGGREGATES PROJECT
DRAFT ENVIRONMENTAL IMPACT REPORT
(ZA 99-05, UP 99-17 and 99-01, and RP 99-01)

Submitted
October 16, 2000

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I. PROJECT DESCRIPTION

The *sine qua non* of an Environmental Impact Report ("EIR") is an adequate project description. As explained in the discussion following Section 15124 of the CEQA Guidelines,[1] the EIR must describe the proposed project "in a way that will be meaningful to the public, to the other reviewing agencies, and to the decision-makers... The state court of appeal declared that an accurate, stable, finite project description is an essential element of an informative and legally sufficient EIR under CEQA." The environmental impacts of a project cannot be analyzed without an adequate project description. The Hat Creek EIR is deficient because it fails to analyze the whole project and contains a large number of internal inconsistencies.

The project consists of a quarry, a crushing and screening operation, a concrete batch plant, an asphalt plant, a concrete trailer staging area, a landscaping materials sales area, and a truck repair shop. (DEIR, pp. 3-8 to 3-18.) Information submitted by the applicant to other agencies indicate that a much larger project is envisioned than the one that was analyzed in the DEIR. The proposed equipment has much greater capacity than assumed in the DEIR. 14-1

I.A PROJECT CAPACITY NOT ANALYZED

Table 1 compares the production of the project evaluated in the DEIR with the design basis of the equipment that would be installed. This table show that the project is designed to support a much larger operation than evaluated in the DEIR. As noted in the DEIR, "the project applicant indicates that the California Department of Transportation (Caltrans) plans to spend $300 million in the Burney district over the next ten years on road improvements." (DEIR, p. 3-8.) Further, the Three Mountain Power project, a new power plant that will be constructed 6 miles southwest of the project site, a proposed truck stop at the junction of State Road ("SR") 89 and 299, and other proposed projects (DEIR, p. 4.3-15), would use large quantities of hot-mix asphalt, concrete, and aggregate. The project appears to have been sized to support the large amount of road improvements and new construction that is anticipated in the area, while the DEIR evaluated a project that would be implemented if this work does not materialize. Because future demand cannot be accurately forecast, the DEIR should evaluate plant capacity. 14-2

The environmental impacts of a project depend upon the capacity of the equipment and facilities that are installed. Normally, an EIR evaluates the impacts that would result from operating at the design capacity of the facility, or 14-3

[1] California Code of Regulations, Title 14, Secs. 15000 et seq. ("CEQA Guidelines").

excavated is about 2.2 million cubic yards.[5] The in-place volume would increase by about 36% as a result of mining. (Church 1981,[6] p. A-5.) This increases the total potential lifetime production to about 3.0 million cubic yards, or over three times more rock than the 900,000 cubic yards analyzed in the DEIR.

The proposed quarry operation either produces a large amount of waste rock, which is not analyzed in the DEIR, or would produce much more aggregate than analyzed in the DEIR. The 70 foot high ore body is reported to have 4 feet of overburden (DEIR, Appx. G, Kleinfelder Report, p. 3), suggesting that at least 6% of the mined material would be stockpiled for later reclamation and is thus not "useable." Further, basalt usually weathers and breaks down to soil faster in the subsurface than it does at the surface. Therefore, it is possible that the aggregate suitable for quarrying in the scarp face does not extend far or uniformly into the subsurface, which would create a substantial amount of waste rock. In either case, the environmental impacts from mining 3.0 million cubic yards of rock should have been evaluated, or an enforceable condition imposed limiting the quarry to the production actually analyzed.

I.A.2 Crushing and Screening Operations

The project includes a crushing and screening operation. The DEIR states that this facility would produce about 30,000 cubic yards (or 60,000 tons)[7] of material per year at a rate of 300 to 1,500 cubic yards per day and that the plant would only operate 400 hours per year. (DEIR, pp. 2-2, 3-13.) This production rate was used to estimate air quality (DEIR, Appx. C, Tables 4-4/4-5) and water impacts. (DEIR, pp. 3-13, 4.7-11.)

However, the information submitted to the SCAQMD suggests that a far larger operation is contemplated. This material includes a brief description of the operation, a list of proposed equipment, and vendor literature for each 14-6
proposed piece of equipment. (Exhibit 3.) The description does not specify a maximum aggregate production rate. The equipment that would be installed includes a primary jaw crusher, a secondary vertical shaft impact crusher, a

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[5] Assuming a 21.36 acre footprint, a 70 ft high vertical cliff, and a final highwall slope of 1:1, the in-place volume is given approximately as the volume of a rectangular prism with dimensions of 70 ft by 395 ft by 2000 ft and a triangular prism with dimensions of 70 ft by 70 ft by 2000 ft. The length of the property line that would be mined is 2000 ft and the average width is 21.36 ac x 43,560 ft^2/ac/2000 ft or 465 ft. Therefore, the in-place volume is: [(70 ft x (465-70) ft x 2000 ft) + 1/2(70 ft x 70 ft x 2000 ft)]0.037 yd^3/ft^3 = 2,227,400 yd^3.

[6] Horace K. Church, Excavation Handbook, McGraw-Hill, Inc., New York, 1981.

[7] The air quality emission calculations assume that the aggregate has a density of 2 tons per cubic yard. See Appendix C, Tables 4-4 and 4-5.

enforceable permit conditions are imposed that restrict operation to the conditions actually evaluated in the DEIR and mitigation monitoring required to assure that they are met.

For example, the Shasta County Air Quality Management District ("SCAQMD"), in comments on the Notice of Preparation, stated that the DEIR for this project should include: "Analyses of the maximum daily and annual emission rates that are projected for the construction and operation phases of the proposed project." (Exhibit 1.[2]) The equipment and facilities that would be installed have substantial excess capacity which was not discussed or evaluated in the DEIR. Further, the hours of operation requested in the use permit application, from 4 AM to 8 PM, Monday through Saturday, for 30-years, were not evaluated in the DEIR. (Exhibit 2.) Thus, the applicant could expand operations in the future with no further environmental review and no mitigation. Specific examples of this problem follow. 14-4

I.A.1 Quarry

Rock would be quarried from a 70 foot high basalt ledge that rises above the valley floor in the southeastern portion of the property. According to the DEIR, 30,000 to 45,000 cubic yards per year of "usable" material or up to 900,000 cubic yards over the 30 year life of the quarry would be mined from this area. This material would be processed annually to yield 20,000 cubic yards of crushed product, 8,000 cubic yards of concrete aggregate, and 2,000 cubic yards of riprap. (DEIR, p. 3-11, Table 3-2.) 14-5

However, the Reclamation Plan[3] suggests that a much larger operation is contemplated. This Plan indicates that the area that would be quarried is a 70 foot high vertical cliff[4] with a footprint of 21.36 acres. The proposal is to excavate the ledge down to the level of the valley floor, leaving a highwall with a 1:1 slope. The land at the top of the cliff is fairly flat, sloping to the west. (Reclamation Plan, pp. 14, 21, Maps 5, 6.) The Mine Plan and cross sections in the Reclamation Plan indicate that the in-place volume of rock that would be

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[2] Memorandum from Rita Cirulis, SCAQMD, to Bill Walker, Associate Planner, Planning Division, Re: Hat Creek Construction, Use Permits 99-5 & 17, November 3, 1999.

[3] Hat Creek Construction, Inc., Reclamation Plan for Eastside Aggregates, Prepared by The Land Designers, Redding, CA and Miller Engineering, Anderson, CA, July 1999.

[4] The DEIR suggests the cliff may actually be 80 ft high, which would increase the amount of rock that could be mined compared to the amount estimated here. See DEIR, pages 3-1 and 3-11 and Appendix G, Kleinfelder Letter, p. 8 and Appendix A, Initial Study.

secondary cone crusher, triple deck sizing screening, and a portable wash plant. (Exhibit 3.)

Rock blasted from the basalt ledge would first be crushed in the primary jaw crusher, which establishes the capacity of the rock crushing operation. The primary jaw crusher is described by the applicant as a "42" x 48" trailer or skid mounted grizzly feeder, jaw crusher, and discharge belt. Fab Tec brand or equal rock reduction 40" x 6"." (Proposed Rock Crushing, Washing, and Screening Plant Description: Exhibit 3.) The named vendor, Fab Tec, indicated that the specified plant normally operates at a rate of 275 to 550 ton/hr, depending upon the hardness and size of the rock. Assuming the plant would only operate for 400 hours per year, as claimed in the DEIR, at an average design rate of 412 ton/hr, the midpoint of the vendor specified range, the crushing operation would produce 165,000 tons per year of rock or nearly three times more than evaluated in the DEIR.

We note, however, that the so-called 400 hour cap was calculated assuming a maximum production of 30,000 cubic yards per year from the quarry, a processing rate of 200 ton/hr, and a rewash and rescreening rate of 50 to 75 ton/yr. (DEIR, p. 3-13.) As discussed above, the quarry is designed to produce over three times more rock than analyzed in the DEIR. Further, the crushing facility is clearly capable of producing far more aggregate than 30,000 cubic yards. Therefore, the crushing facility would likely operate much more than the 400 hours per year evaluated in the DEIR. Unless operation is limited to 400 hours per year in a permit or other enforceable condition, and specific mitigation monitoring is required, the crushing facility could produce up to 550 ton/hr of aggregate for up to 16 hr/day or longer throughout the construction season, producing about 1.6 million tons or 792,000 cubic yards of material per year. As demonstrated below, impacts at this level of operation would be significant and require mitigation.

The crushing operation also includes a portable wash plant. The information the applicant submitted to the SCAQMD indicates that it proposes to use a Fab Tec portable wash plant Model 5-16 or equivalent. (Exhibit 3.) Based on discussions with the vendor, this plant has a design capacity of 100 ton/hr for sand up to 250 ton/hr for larger material. The analyses in the DEIR assume that the plant would wash 18,000 cubic yards[8] or 36,000 tons per year of aggregate. (DEIR, p. 3-13.) The size is not noted but, presumably, it would

[8] The DEIR states that 900,000 gallons of water, estimated at 50 gallons per cubic yard, would be used for washing per year. (DEIR, p. 3-13.) Therefore, 900,000 gal/50 gal/yd^3 = 18,000 yd^3 of aggregate would be washed. Assuming this material weighs 2 ton/yd^3, as assumed in Appendix C, the DEIR assumed that 36,000 ton/yr would be washed.

mostly be larger than sand to produce hot mix asphalt for paving.[9] Further, according to the DEIR, sand for the asphalt plant is imported. (DEIR, p. 3-14.) Assuming that the plant only operates 400 hours per year, its throughput would be 90 ton/hr, which is lower than the lower end of the operating range quoted by the vendor and clearly inconsistent with aggregated sized for hot mix asphalt.

It is unlikely that the applicant would install an oversized plant (for rock crushing, concrete or asphalt) with substantial excess capacity unless the applicant anticipates that it will eventually be able to utilize that capacity to bid currently projected Caltrans projects in the area. The applicant's fixed cost in the plant would be spread over actual utilization of equipment. The higher the utilization, the lower the unit cost of asphalt and the more competitive the product. The project described in the DEIR and sized in documents submitted to SCAQMD in August 2000 would not be cost effective due to the large excess capacity and hence, high fixed costs. See, for example, the discussion of effect of equipment capacity on costs in Exhibit 4. The equipment would also not operate efficiently at only a few percent of its design rate.

I.A.3 Concrete Batch Plant

The project includes a portable concrete batch plant that would have an annual average output of 8,000 cubic yards and a maximum annual output of 25,000 cubic yards. (DEIR, p. 3-14.) However, the use permit application concedes, "The plant could operate all year, but most construction activity is in 14-7
the summer months." (Exhibit 2.) The air quality impacts were based on the production of only 8,000 cubic yards per year. (DEIR, Appx. C, Table 4-8.) The 14-8
water use of the plant was not included in the DEIR. (DEIR, § 4.7.)

However, the information that the applicant submitted to the SCAQMD suggests that a far larger operation is contemplated. A Ross 23 cubic yard 400 MVR Bandit is proposed. The capacity of this plant is 200 cubic yards per hour. (Exhibit 3.) According to the vendor, these plants are typically operated at a rate of 160 to 180 cubic yards per hour. Therefore, the applicant's estimates of concrete production suggest that the plant would only be operated an average of 14-9
47 (8000/170) and a maximum of 147 (25,000/170) hours per year. It is unlikely that the applicant would purchase and maintain a 200 cubic yard concrete plant that it only plans to operate 47 to 147 hours per year. Further, when a plant is operated at only a fraction of its design rate, it is not efficient.

Clearly, much larger production is contemplated. The DEIR assumed that the concrete plant would operate 210 days per year. (DEIR, Appx. B, p. A-1.)

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[9] Asphalt Institute, The Asphalt Handbook, Manual Series No. 4, 1989.

Assuming that it operates up to 16 hours per day at its design capacity of 200 cubic yards per hour, this facility could produce up to 672,000 cubic yards of concrete per year, or over 80 times more than was analyzed in the DEIR. Therefore, unless operation is limited to 8,000 cubic yard per year in a permit or other enforceable condition, and specific mitigation monitoring is required, the concrete plant could produce much more material than was analyzed in the DEIR, depending on market demand. As demonstrated below, the higher production suggested by the applicant's design specifications would result in significant impacts and require mitigation.

I.A.4 Asphalt Plant

The project description states that the asphalt plant would produce an average of 10,000 cubic yards or 15,000 tons of hot mix asphalt per year. (DEIR, Appx. B, p. A-2.) It would operate from April to October from 4:00 AM to 8:00 PM (16 hrs), with average hours of operation from 6:00 AM to 5:00 PM (11 hrs), Monday through Friday, with occasional production on Saturday. (DEIR, p. 3-14.) This amounts to operating between 148 and 180 days per year[10] for 11 to 16 hours per day.

The DEIR acknowledges that for large jobs, a portable drum mix plant would be installed on the site, but claims that "the maximum amount that could be produced by both the asphalt plant and the portable drum mix plant in a year would be 100,000 cubic yards." (DEIR, p. 3-14.) Similar assurances occur throughout the DEIR. (E.g., DEIR, p. 3-14; Appx. B, p. A-2; Appx. C, p. 4.) The traffic volume appendix acknowledges that large paving projects could generate the demand for extra asphalt, up to 2,500 cubic yards or 3,750 tons per day for up to six weeks at a time. (DEIR, Appx. B, p. A-3.) The DEIR calculates traffic volumes for this larger demand, but does not use these larger volumes to estimate air quality or water supply impacts. 14-10

It is also evident from materials submitted to other agencies that the applicant plans to build and operate a much larger asphalt plant than contemplated or evaluated in the DEIR. Even though the DEIR acknowledges that the proposed asphalt plant could operate at up to 100,000 cubic yards or 150,000 tons per year, most environmental impact analyses only considered the smaller, 10,000 cubic yard per year facility. 14-11

Agency files suggest that a far larger project is planned than even the 100,000 cubic yard project mentioned in the DEIR. The information filed by the 14-12

[10] There are 214 days between April and October, of which 62 are weekend days and 4 are holidays (Memorial Day, July 4, Labor Day, Columbus Day).

applicant at the SCAQMD indicates that the applicant is proposing to install a 450 ton per hour ("ton/hr") portable drum mix asphalt plant. (Exhibit 3.) Assuming that this plant operates 148 to 180 days per year for 11 to 16 hours per day as stated in the DEIR, it could produce 732,600 to 1.3 million tons per year of hot mix asphalt or over 80 times more than the 15,000 ton/yr that was evaluated in the DEIR, unless its production is specifically limited by enforceable permit conditions.

To put this into perspective, in calculating traffic volumes, the DEIR estimated that the asphalt plant would produce only 94 tons/day of hot mix asphalt, which would require only 6 trucks per day, emitting about 2 pounds of particulate matter. (DEIR, Appx. B, p. A-2; Appx. C, Table 4-9.) This is only about 21% of the amount of asphalt that the proposed plant could produce in *one hour* and 1.3% of the amount of hot mix asphalt that it could produce in a 16 hour day. In fact, about 460 trucks emitting 152 pounds of particulate matter every day would be required to haul the hot mix asphalt that could be produced by the plant the applicant proposes to install. Therefore, clearly, the applicant is proposing to install a facility with substantial excess capacity. Normally, an EIR evaluates the *full* capacity of project equipment, not a tiny fraction of that capacity, as is the case here.

The applicant stated in materials submitted to the SCAQMD that "the exact specifications for the plant will closely resemble Northstate Asphalt's pug mill plant on Clear Creek Road in Redding." (Asphalt Plant Operation, Exhibit 3.) I reviewed the SCAQMD's files on the Northstate asphalt plant and relevant information is included here in Exhibit 5. This material indicates that the Northstate facility includes a 350 ton/hr asphalt plant that operates at an average rate of 225 ton/hr. (Device Information Sheet: Exhibit 5.) Assuming this plant would operate 11 to 16 hours per day and 148 to 180 days per year, as stated in the DEIR, it would produce 366,300 (11x148x225) to 1,008,000 (16x180x350) tons per year of hot mix asphalt.

The permit issued to Northstate limits the asphalt plant to 350 ton/hr for 12 hrs/day for up to 1,000 hours per year. (PTO 86-PO-59g: Exhibit 5.) Therefore, this facility, which Hat Creek alleges is similar to what they propose to install, is permitted to produce 350,000 ton/yr of hot mix asphalt, or over two times more than the so-called occasional maximum claimed by Hat Creek, which was not evaluated in the DEIR. This production rate is consistent with the quarry production rate reflected in the Reclamation Plan, which is three times higher than evaluated in the DEIR. However, unlike Northstate, there are no production limits required for Hat Creek in either the DEIR nor the applicant's permit application to the SCAQMD.

Finally, actual production at the Northstate facility in 1999 was 160,000 tons and the maximum daily production was 3,000 tons. (Invoice - Annual Device Information Update: Exhibit 5.) This is about 10% more than the claimed occasional maximum production by Hat Creek, which amount was not evaluated in the DEIR. Presumably, production from Northstate and Hat Creek would significantly increase when CalTrans implements its road construction projects and Three Mountain Power constructs its new power plant. 14-13

Clearly, the proposed asphalt plant could produce far more hot mix asphalt than analyzed or discussed in the DEIR. Unless operation is limited to the throughput actually analyzed in the DEIR in a permit or other enforceable condition, and specific mitigation monitoring is required, the asphalt plant could produce as much as 1.3 million tons of hot mix asphalt during the construction season. As demonstrated below, impacts at this level of operation would be significant and require mitigation.

II. HYDROLOGY AND WATER QUALITY

The hydrology and water quality analyses in the DEIR are based on a large number of faulty assumptions and incomplete information about the project and local hydrology. Some impacts were not discussed or analyzed at all. As discussed below, when these errors and omissions are corrected, the project would result in a significant impact to local water resources.

II.A WATER USE IS UNDERESTIMATED

The analyses in the DEIR assume that the project would only use either 900,000 gallons of water per year (DEIR, pp. 3-13, 4.7-11) or double that amount for cumulative analyses, 1,800,000 gallons. (DEIR, p. 4.7-14/15.) The 900,000 gallon figure was calculated for the wash plant alone, assuming it would use 50 gallons of water per cubic yard of material washed and would only operate for 400 hours per year. (DEIR, p. 3-13.) No support is provided for either assumption. The 1,800,000 gallon figure was estimated by arbitrarily assuming all other water uses -- quarry, concrete plant, asphalt plant, repair shop -- would be the same as the wash plant and was only used in the cumulative analysis. 14-14

However, based on my experience working on other similar plants, these types of facilities use substantially more water than revealed in the DEIR. The DEIR mentions that "water would also be required for dust control activities at the plant sites and on unpaved portions of the site." (DEIR, p. 4.7-11.) Some mitigation measures require the use of water, e.g., MM 4.3.3.a: "All areas with vehicle traffic, including unpaved roadways, shall be watered periodically." (DEIR, p. 4.3-13, MM 4.3.3a). However, it does not estimate the amount of water 14-15 that would be required, instead arguing that "the most significant water user would be the crushing and screening operation." (*Ibid.*) This is not necessarily true, particularly if the plant is operated to assure that nuisance dust is controlled, as it must be. The fugitive dust emissions in the air quality section, for example, were calculated assuming 80% to 90% control (DEIR, Appx. C, Tables 4-5, 4-6, 4-8), which requires a substantial amount of water. Dust control is typically a major water use for aggregate processing projects, and typically comprises 50% or more of the total demand.

Therefore, I have estimated the water use in the following sections for two scenarios, the project described in the DEIR (Table 2) and the project based on design specifications submitted to the SCAQMD (Table 3). These calculations indicate that the project described in the DEIR would use between 21 and 23 million gallons of water per year, or over 20 times more than evaluated in the DEIR. 14-16 Based on the design capacity of the equipment that would be installed and the Mine Plan, the project could use up to 133 million gallons of water per year, or nearly 150 times more than evaluated in the DEIR. As discussed below, the use of this amount of water would result in significant impacts that were not identified, evaluated, or mitigated in the DEIR.

II.A.1 Quarry

The proposed quarry operations include removing loose rock by caterpillar, loader and excavator with a breaker. The caterpillar would rip the rock where feasible. 14-17 The remaining rock would be blasted, up to six times per year, and a caterpillar would push loosened material to the processing area. (DEIR, p. 3-12.) All of these operations produce large quantities of dust, which is ordinarily controlled using water sprays.[11] The DEIR did not include any water use for dust control at the quarry.

These types of uses require 15 gal/yd^3 to 65 gal/yd^3, depending upon annual rainfall and the nature of the proposed operations. (Church 1981, pp. 10-4 to 10-6.) Using the mean of this range, or 40 gal/yd^3, the project described in the DEIR, which is claimed to produce only 30,000 yd^3 to 45,000 yd^3 of "useable" 14-18 material, would use 1.2 to 1.9 million gallons of water per year to control dust from quarry operations. Actual water use would be higher because some of the mined material is not "useable," and presumably would be stockpiled and used in reclamation. The DEIR does not estimate the quantity of unusable material that would be mined.

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[11] H.E. Hesketh and F.L. Cross, Jr., Fugitive Emissions and Controls, Ann Arbor Science, Ann Arbor, MI, 1983; C. Cowherd, P. Englehart, G.E. Muleski, J.S. Kinsey, and K.D. Rosbury, Control of Fugitive and Hazardous Dusts, Noyes Data Corp., Park Ridge, NJ, 1990.

However, the Reclamation Plan indicates that 3.0 million cubic yards of rock would be quarried over the 30-year life of the quarry. (Comment I.A.1.) 14-19
Therefore, up to about 4 million gallons of water per year would be used for quarry dust control.

II.A.2 Crushing and Screening

The mine-run rock would next be crushed and screened to produce aggregate and other crushed products. The proposed facility includes a primary jaw crusher, a secondary VSI impactor, a cone crusher, sizing screens, conveyors, a wash plant, and five product stockpiles. (Exhibit 3.) Water would be required to control dust from the crushers, impactors, screens, conveyors, stockpiles, and 14-20
general work area. Impactors are generally major dust sources and require special attention and frequently require foams to adequately control the dust. (Exhibit 6.) Water would also be required to wash the chip seal, concrete aggregate, leach rock, and some of the asphalt aggregate. The DEIR estimated that the wash plant would use 900,000 gallons of water, but did not estimate water use for dust control. (DEIR, p. 3-13.)

The DEIR underestimated the amount of water that would be used by the wash plant. The DEIR assumes that the wash plant would only use 900,000 14-21
gallons of water, calculated assuming the plant would operate only 400 hours per year and use 50 gallons per cubic yard. This is inconsistent with the vendor's estimates and information the applicant's consultant submitted to the County.

The vendor, based on specifications submitted to SCAQMD (Exhibit 3), indicates that the proposed plant has a design capacity of 100 ton/hr for sand up to 250 ton/hr for larger material. The DEIR (Table 3-2) and facility plot plan (Exhibit 3) indicate that most of the material washed at this plant would be larger 14-22
than sand. The vendor also indicates that this plant uses an average of 500 and a maximum of 800 gallons per minute ("gal/min") of water for washing. Assuming that it only operates 400 hours per year at the average rate of 500 gal/min, the washing plant alone would use 12 million gallons of water (Table 2), not the 900,000 gallons claimed in the DEIR. (DEIR, p. 3-13.)

The applicant, on the other hand, assumed that the wash plant would process 75 ton/hr, less than the lower design limit, and would use 40,000 gallons 14-23
per day.[12] Assuming the plant would operate throughout the construction

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[12] Memorandum from Keith Hamblin, The Land Designers, to Bill Walker, Re: Eastside Aggregates Water Consumption at Wash Plant, October 18, 1999.

season, based on this estimate, it would use 7.2 million gallons, substantially more than evaluated in the DEIR.

If the plant operated more than 400 hours per year, which is likely based on the Mine Plan (Comment I.A.2), water demand would be even higher. The mitigation conditions do not restrict the hours of operation of the facility, which would be operated to supply aggregate to the on-site asphalt and concrete plants and construction jobs in the area, in response to local demand. The construction season in the area is about 180 days, from April to October. (DEIR, p. 3-14.) 14-2
Since the crushing plant could operate from 4 AM to 8 PM, or 16 hours per day (DEIR, p. 3-13), the washing plant could potentially operate up to 2,880 hours per year. Therefore, up to 86.4 million gallons of water could be used by this plant (Table 3), unless the DEIR imposes limits on its operation and requires mitigation monitoring to assure water use is appropriately limited.

The DEIR did not estimate the amount of water that would be required for dust control at the crushing and screening plant, even though the air quality analysis assumes 80% to 90% dust control. (DEIR, Appx. C, Table 4-5.) Water use for dust control is conventionally estimated assuming about 1.5% by weight 14-25
water is added. (Exhibit 7.) Assuming the crushing and screening facility process 30,000 to 45,000 cubic yards (DEIR, pp. 3-11/13) and that dust is controlled within the facility by adding water at 1.5% by weight, an additional 219,000 to 328,500 gallons[13] of water would be required. (Table 2.)

However, assuming the design capacity of the plant, as reported to the SCAQMD, the crushing and screening facility could process up to 550 ton/hr of rock for 2,880 hours per year. Assuming that dust is controlled by adding water 14-2
at 1.5% by weight, up to 5.8 million gallons of water could be used every year for process dust control. (Table 3.) Additional water would be required to control dust from the stockpiles, the work area, and from loading and unloading, which are included below in the unpaved process area calculations.

II.A.3 Concrete Plant

Water is used at a concrete plant to hydrate the cement and for dust control and wash water in the processing area. The DEIR does not separately estimate water demand for the concrete plant, arbitrarily doubling the wash 14-27
water rate of 900,000 gallons per year for all other uses for the cumulative impact analysis only. (DEIR, p. 4.7-15.) The vendor of the proposed concrete batch plant (Exhibit 3) indicates that it typically uses 37 gallons of water per cubic yard

[13] Water required for process dust control at crushing and screening facility = $(0.015)(1.015)(30{,}000\ yd^3)(2\ ton/yd^3)(2000\ lb/ton)(7.48\ gal/ft^3)/62.4\ lb/ft^3 = 219{,}000\ gal.$

of production. Of this amount, 35 gal/yd^3 is used in the process and 2 gal/yd^3 is used in the tank truck to wash down the chutes at the job site. Therefore, assuming the plant would produce 8,000 to 25,000 cubic yards of concrete per year (DEIR, p. 3-14), it would use 296,000 to 925,000 gallons of water (Table 2). The maximum water use, based on plant capacity and 2,880 operating hours per year, would be 21.3 million gallons (Table 3).

II.A.4 Asphalt Plant

Water is used to control dust from bins, elevators, conveyors, and loading. Water use for these purposes is typically estimated assuming the use of sprays to bring the water content up to 1.5% by weight. (Exhibit 7.) Assuming that the asphalt plant produces only 10,000 to 100,000 cubic yards of hot mix asphalt (DEIR, p. 3-14) with an average density of 1.5 ton/yd^3 (DEIR, Appx. C, Table 4- 14-28
6), 54,800 to 547,600 gallons of water would be required for dust control every year. (Table 2.) The design capacity of the proposed plant indicates that up to 450 ton/hr of hot mix asphalt could be produced (Exhibit 3) for up to 2,880 hours per year. Assuming dust is controlled by adding 1.5% by weight water, up to 4.7 million gallons of water per year would be required to control dust (Table 3).

II.A.5 Unpaved Process Areas

Additional water would be required throughout the plant site to control dust from storage piles, unpaved roads, and unpaved process areas. (DEIR, pp. 4.3-13, 4.7-11.) According to site maps in the Reclamation Plan and the DEIR (Fig. 3-5B), it does not appear than any of the area that would be disturbed is paved. The only paved areas are the driveway entry to the south and the parking lot. The quarry, crushing and screening plant, concrete plant, and asphalt plant would occupy an area of 85.48 acres. Subtracting the area occupied 14-29
by the quarry (22.93 ac) and retention basins (30.4 ac), about 32.15 acres would be disturbed surfaces that would generate dust. (Reclamation Plan, p. 21.) Dust is generally controlled from such areas by applying about 0.01 inches of water as frequently as required to keep the dust down.[14] Assuming that 0.01 inches of water is applied to 32.15 acres four times per working day (11 to 16 hrs) for 180 days per year, 6.3 million gallons would be used.[15]

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[14] H.E. Hesketh and F.L. Cross, Jr., Fugitive Emissions and Controls, Ann Arbor Science, 1983, p. 45.

[15] Unpaved area dust control = (32.15 ac)(43,560 ft^2/ac)(0.01 in/12 in/ft)(7.48 gal/ft^3)(180 days/yr)(4 applications) = 6,285,238 gal.

II.A.6 Incidental Uses

Incidental uses include sanitary uses by employees and the permanent caretaker and washwater for vehicles and plant equipment.

The DEIR indicates that the facility would have from 25 to 37 employees. (DEIR, Appx. B, p. A-3.) The average water use for workers is 50 gallons per person per shift. (van der Leeden et al. 1990,[16] p. 337.) Assuming 250 workdays per year per person and one shift per day, the total sanitary water demand would be 312,500 to 462,500 gallons per year. In addition, a caretaker would reside on-site and use an on-site well for water.[17] Assuming a family of two and a water demand of 150 gallons per person per day (*Ibid.*), the caretaker quarters would use 109,500 gallons per year. (Table 2.) 14-30

Generally, the types of facilities proposed here have cleaning facilities. The exterior of trucks and wheel wells are periodically washed. Spilled aggregate around the crushing, concrete, and asphalt plants are normally washed into a catch basin. Concrete is washed out of mixing drums at the end of a batch. Assuming that these uses require 500 gallons per day for 250 workdays per year, this would require an additional 125,000 gallons of water per year. (Table 2.)

II.B GROUNDWATER PUMPING IMPACTS ARE SIGNIFICANT

The project would obtain its water supply from on-site wells. (DEIR, Fig. 3-5A, pp. 3-18, 4.7-11/12.) As discussed below, groundwater pumping to supply the project could result in a number of significant impacts, including drawdown in nearby wells owned by others and reduction in the flow of nearby springs. The DEIR did not adequately evaluate these impacts.

II.B.1 Drawdown Impacts Were Not Evaluated And Are Significant 14-31

The DEIR did not discuss or evaluate the impact of project pumping on water levels in nearby wells. The project would pump up to 133 million gallons of water per year or about 770 gallons per minute ("gpm")[18] during the construction season. Most of this pumping would occur during the peak use summer period when other nearby users (DEIR, p. 3-4), including the adjacent

[16] Frits van der Leeden, F.L. Troise, and D.K. Todd, The Water Encyclopedia, 2nd Ed., Lewis Publishers, 1990.

[17] Shasta County, Application for Sewage Disposal System Permit (for permanent nightwatchman's quarters, 2 bedrooms), February 28, 2000, Plot Plan.

[18] Daily pumping = 133,016,700 gal/yr/(180 day/yr)(16 hr/day)(60 min/hr) = 769.8 gal/min.

State Park and other on-site users are likewise pumping at maximum rates. The on-site well, for example, can pump up to 6,000 gpm. This could result in significant project and cumulative drawdown impacts on nearby domestic wells.

Normally, wells within a 1 to 2 mile radius of a project site are located on a map and boring logs are provided. The impact of project pumping on these and other wells would normally be evaluated by performing a well interference study to determine whether project pumping would drawdown the water levels within the wells. The impact radius within which drawdown would occur could be substantial here because the aquifer the project pumps from is confined. (Comment II.B.1.) The DEIR is defective because it failed to include this analysis.

The area around the project site is rural, unincorporated, and is not served by a water district. Residences and businesses rely on private wells for their water supply. Boring logs on file at the Department of Water Resources (Exhibit 8) and other studies (Exhibit 9) indicate that there are at least seven wells within 1 mile of the project well. The Planning Commission files on this project indicate that "there is a residential and vacation home area along Clark Creek Road on the east side of State Route 89 across from this project site."[19] Domestic water in the area is supplied from wells. The geohydrologic study relied on in the DEIR (p. 4.7-3) states: "Numerous domestic wells are located near the site. These wells are screened in the basalt and are used as the primary source of drinking water in the area." (Carlson 11/4/86.[20]) There is also a small shop, Fletcher's, on the east side of SR 89, immediately north of the site driveway, and within about 1,000 feet of the main site well, that presumably uses a well.

The nearest confirmed domestic wells are those that supply the Burney Falls Trailer Park and the Studenicka residence at 37971 Clark Creek Road (Figure 3). The Trailer Park well is located 2,500 feet northwest of the main industrial well at the site, at the southern end of the Park. The Studenicka well is located 3,400 feet northwest of the main industrial well. Distances were scaled from the USGS 7-1/2 minute quads for Cassel and Burney. The Burney quad indicates that there are several additional residences in the vicinity of the Studenicka well, some apparently closer to the project well than the Studenicka well. These properties also reportedly obtain their water from wells.

I conducted a drawdown analysis to determine the impact of project pumping on the Burney Falls Trailer Park well, the Studenicka well, and any

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[19] Shasta County Planning Commission, Zone Amendment 99-05 and Use Permit 99-05, Report to the Shasta County Planning commission, July 8, 1999, Agenda Item #0, p. 1.

[20] Fritz R. Carlson, Hydrogeologic Investigation at Louisiana-Pacific Lumber Mill, Burney, California, November 4, 1986.

other nearby domestic wells that have not been specifically identified. Drawdown is the lowering of the water table in a well caused by pumping. Drawdown will reduce the yield or capacity of nearby wells and increase pumping costs. If wells are operated by a diesel motor, drawdown will also increase air emissions. The DEIR did not evaluate any of these impacts.

Well interference effects were estimated using a spreadsheet model based on the confined solution of the Theis equation. (Maidment 1992, Sec. 6.4.3).[21] The drawdown **s** in an aquifer caused by pumping at any point in the aquifer is directly proportional to the pumping rate **Q** and the length of time **t** that pumping has been in progress and is inversely proportional to the transmissivity **T**, the storage coefficient **S**, and the square of the distance r^2 between the pumping well and the point of interest (e.g., Burney Falls Trailer Park and Studenicka wells). This relationship is referred to as the Theis equation, which is as follows:

$$s = 114.6QW(u)/T \qquad (1)$$

$$u = 1.87r^2S/Tt \qquad (2)$$

where:

s = drawdown in feet at any point in the vicinity of a well discharging at a constant rate

r = distance in feet from the center of a pumped well to a point where the drawdown is measured

Q = pumping rate in gpm of new wells

T = aquifer transmissivity in gpd/ft

t = time since pumping started in days

S = coefficient of storage (storativity)

W(u) = well function of u which is an exponential integral. (Neuman 1975).[22]

The well function was interpolated from a look-up table in the spreadsheet model.

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[21] David R. Maidment (Ed.), Handbook of Hydrology, McGraw-Hill, Inc., New York, 1992.

[22] S.P. Neuman, Analysis of Pumping Test Data from Anisotropic Unconfined Aquifers Considering Delayed Gravity Response, Water Resources Research, v. 11, pp. 329-342, 1975.

Drawdown reduces the yield or capacity of other nearby wells. Well yield is proportional (the symbol used here for "is proportional to" is "~") to transmissivity of the aquifer, which in turn is calculated from the product of hydraulic conductivity **K**, a constant, and saturated aquifer thickness **b** as follows:

$$Q \sim T = Kb \qquad (3)$$

where:

K = hydraulic conductivity in gpd/ft^2

b = saturated aquifer thickness in feet

Drawdown **s** reduces the saturated aquifer thickness **b** and as pumping progresses, aquifer thickness **b** declines by an amount **b-s**. Therefore, the reduction in yield is directly proportional to the ratio of the drawdown to initial aquifer thickness **s/b**. The percent reduction in yield R can be estimated as follows:

$$R = 100s/b \qquad (4)$$

where b is the initial saturated thickness of the aquifer.

Equations (1) through (4) indicate that six variables must be specified to calculate drawdown (s) and its impact on yield. These variables are the pumping rate of project well **Q**, the distance between the project well and wells of interest, **r**, pumping time **t**, and aquifer properties **T**, **S**, and **b**.

The transmissivity and aquifer thickness were determined for five on-site wells in 1986. The transmissivity averages 837,000 gpd/ft[23] and the aquifer thickness averages 29 feet. (Carlson 1989, Table 1.) The method used by Carlson to estimate transmissivity is known to overestimate in fractured aquifers such as basalt aquifers. Therefore, the actual transmissivity is likely lower than estimated by Carlson, which would result in underestimating well drawdown impacts.[24] The aquifer beneath the site is confined, based on several driller's reports on file at the Department of Water Resources. (Exhibit 8.) The storativity

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[23] Estimated from the geometric mean hydraulic conductivity of 3,900 ft/day as: (3,900 ft/day)(27.9 ft)/0.13 ft^2/gal = 837,000 gpd/ft.

[24] O. Rimawi and A. El-Naqa, Assessment of Transmissivity from Specific Capacity Data of Fractured Basalt Aquifers in the North-Northeastern Part of Jordan, Arab Gulf Journal of Scientific Research, v. 13, number 3, 1995, pp. 463-479.

of most confined aquifers ranges from 0.001 to 0.00001. (Exhibit 10.[25]) The smaller the storativity, the greater the drawdown. Therefore, I conservatively assumed a storativity of 0.001 in the drawdown calculations (Driscoll 1987, p. 1021), which represents the upper end of the usual range.

The results of this analysis are summarized in Table 4 for three pumping rates: (1) 770 gpm based on project design capacity (Table 3); (2) 4,000 gpm based on well capacity as reported in the original driller's log and County files;[26] and (3) 6,000 gpm based on well capacity reported on a recent April 1999 proposed zoning map. (Exhibit 11.) The maximum pumping rates represent cumulative on-site drawdown impacts.

This table shows that the project would cause a drawdown of 1.2 feet after 1 year of pumping at 770 gpm in wells located 1,000 feet from the project well, 1.0 foot at the Burney Falls Trailer Park well (2,500 ft), and 0.95 feet in the Studenicka well (3,400 ft). At the end of the 30-year project life, these drawdowns would increase to 1.6 feet at 1,000 feet, 1.4 feet at 2,500 feet, and 1.3 feet at 3,400 feet, respectively. These drawdowns correspond to reductions in yield of 3% after 1 year and 4% to 5% after 30 years at the Trailer Park and Studenicka wells.

The cumulative drawdown from pumping the existing well at 4,000 gpm for 1 year would be 6.3 feet in wells 1,000 feet from the project well, 5.3 feet in the Burney Falls Trailer Park well, and 4.9 feet in the Studenicka well. These drawdowns would increase to 8.1 feet, 7.1 feet, and 6.8 feet, respectively, after 30 years of pumping. Even if the on-site well were pumped for as little as 1-day at 4,000 gpm, it would create large drawdowns in off-site wells, 2.0 feet in the Burney Falls Trailer Park well, and 1.7 feet in the Studenicka well. (Table 4.) These drawdowns correspond to reductions in yield of 6% to 7% after 1 day, 17% to 18% after 1 year, and 23% to 24% after 30 years of pumping at the Trailer Park and Studenicka wells. Drawdowns would be 30% to 45% higher if the lower end of the storativity range for confined aquifers were used.

The cumulative drawdown from pumping the existing well at 6,000 gpm for 1 year would be 9.4 feet in wells 1,000 feet from the project well, 7.9 feet in the Burney Falls Trailer Park well, and 7.4 feet in the Studenicka well. These drawdowns would increase to 12.2 feet, 10.7 feet, and 10.2 feet, respectively, after 30 years of pumping. Even if the on-site well were pumped for as little as 1-day

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[25] D.K. Todd, Groundwater Hydrology, 2nd Ed., John Wiley & Sons, New York, 1980; R.C. Heath, Basic Ground-Water Hydrology, USGS Water-Supply Paper 2220, 1983.

[26] See, for example, file on Zone Amendment 99-05 and Use Permit 99-05, Description of Project for C-M Zoning and Use Permit, p. 2 ("There is also a 4,000-gallon per minute well that presently goes to a stand pipe to fill water trucks.")

at 6,000 gpm, it would create large drawdowns in off-site wells, 3.0 feet in the Burney Falls Trailer Park well and 2.6 feet in the Studenicka well. (Table 4.) These drawdowns correspond to reductions in yield of 9% to 10% after 1 day of pumping, 26% to 27% after 1 year, and 35% to 37% after 30 years of pumping. Drawdowns would be 30% to 45% higher if the lower end of the storativity range for confined aquifers were used.

Normally, a drawdown of 1 foot or more is considered to be significant because it reduces the capacity and increases the cost of operating off-site wells. Therefore, project pumping would result in a significant impact that was not discussed in the DEIR. This impact should be evaluated and mitigated and the DEIR recirculated for public review.

II.B.2 DEIR's Discussion Of Pumping Impacts On Springs Is Flawed

The DEIR argues in Impacts 4.7-3 and 4.7-5 that impacts on springs and Burney Falls from the pumping 900,000 gallons per year of groundwater would not be significant. Notwithstanding the fact that substantially more water than 900,000 gallons per year would be used, the water impact analysis in the DEIR is technically incorrect. 14-32

First, the DEIR argues that the 900,000 gallons of washwater would be conveyed to retention basins[27] and a portion would therefore infiltrate back to the groundwater aquifer, replacing water that was pumped. (DEIR, p. 4.7-11.) This is inconsistent with the local hydrogeology. The geohydrologic study that the DEIR relied on concluded that there was a low-permeability layer on the bottom of the ponds, limiting vertical seepage. (Carlson 11/4/86, pp. 6-7.)

The boring logs for on-site wells and other wells in the northern end of the Burney Basin (Exhibit 8) indicate that the groundwater aquifer beneath the site (from which the project would pump) is confined (e.g., the wells are "artesian" wells). The first encountered water is typically deeper than the static water level, caused by water rising in the wells after drilling. This occurs when an aquifer is confined by an impermeable layer overlying the aquifer. (Exhibit 10.) Such an impermeable confining layer would prevent infiltrating water from entering the same aquifer from which it was pumped, consistent with Carlson's conclusion that there is a low permeability layer beneath the ponds. Thus, the aquifer is isolated from any water that would seep out of the ponds. Recharge from the ponds would not replenish the aquifer that supplies the project's water. Therefore, project pumping could cause drawdown in other nearby wells, or 14-33

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[27] These retention ponds would be located in the area of former mill ponds. See, for example, Figure 3-5A, page 4.7-8, and Appendix A, Initial Study.

impact nearby springs that would not be offset by infiltration from the retention ponds.

Further, the DEIR's estimate of wash water demand, 900,000 gallons, is only about 4% of the total plant demand of 20.7 million gallons (Table 2), with wastewater being routed to the ponds. (It is actually about 50% when correctly estimated.) The balance would be fully consumed in the process, either by evaporation for dust control, or by export in the product, e.g., cement. Therefore, the suggestion that the project's water use would not result in impacts because it recharges the aquifer is incorrect. 14-34

Second, the DEIR argues that the site was formerly used as a sawmill and plywood mill, which used large quantities of water. (DEIR, pp. 3-1, 4.7-11.) The DEIR argues that because "water usage by the project is not likely to be greater than that of previous uses on the project site" (DEIR, p. 4.7-13), the proposed use would not result in a significant new impact. (DEIR, p. 4.7-12.) This is irrelevant. The cited uses were originally developed in 1955, long before CEQA was promulgated in 1971, and discontinued in either 1983 or 1989.[28] (DEIR, p. 3-1.) There is no evidence that these uses did not result in significant environmental impacts. Further, there is no evidence that the environmental impacts of these former uses were ever evaluated and mitigated as now required by CEQA.

The existing physical environment is normally the baseline condition against which a project's environmental impacts are measured. CEQA Guidelines § 15125 and Discussion. The California Court of Appeal has emphasized the need to evaluate a project's impacts against the existing physical environment in order to avoid "mislead[ing] the public as to the reality of the impacts and subvert full consideration of the actual environmental impacts which would result." Environmental Planning and Information Center v. County of el Dorado, 131 Cal.App.3d 350, 358 (1982). The suggestion in the EIR that water use impacts will not be significant merely because similar or larger amounts of water were used at the site previously circumvents the intent of CEQA to evaluate the impact of a project based on its incremental change in the existing physical environment. 14-35

Third, in discussing Impact 4.7-3, the DEIR argues that project pumping would not affect Burney Falls or other local spring flows because the main source of these flows is the Burney Mountain-Crater Peak area, which would not be affected by the project. (DEIR, p. 4.7-12.) This is incorrect. Water recharged in this area moves north through the Burney Basin, discharging at Burney Falls

[28] Another source relied on by the DEIR claims these uses were permitted in 1956 and discontinued in 1983. (Carlson 11/4/86, pp. 4-5.)

(Figure 1). (Exhibit 9.) The project wells are located between the recharge area at the southern end of the Burney Basin and Burney Falls at the northern end and pump water from the same aquifer that discharges at the Falls.

Further, additional work by the same researchers relied on by the DEIR (p. 4.7-3) subsequently concluded that water discharging at Burney Falls is actually a mixture of water from two separate basins. The DEIR itself acknowledges this elsewhere in the document. (DEIR, pp. 4.7-13/14.) Only 40% to 60% of the water discharging at Burney Falls originates in the Burney Mountain-Crater Peak area. The balance originates in the Hat Creek Basin and flows beneath the project site. (Exhibit 12.[29]) This is demonstrated by the cross section shown in Figure 2, which shows that project wells intercept the upper aquifer that originates in the Hat Creek drainage and discharge at the Headwater Springs in Burney Creek and at Burney Falls.

Therefore, the reasoning used in the DEIR to conclude that project pumping would not affect spring flows is simply wrong. The analyses presented below demonstrate that the impacts are significant and therefore must be mitigated.

II.B.3 Project Pumping Would Significantly Reduce Spring Flows

A spring is a concentrated discharge of groundwater appearing at the ground surface as a current of flowing water. The springs in the project area represent one of the largest spring systems in the United States and are a unique natural resource that attracts visitors to the Intermountain area. They also provide critical habitat for a unique biota, which includes the threatened and endangered Shasta crayfish. The project is uniquely close to this important spring resource, lying only 2.5 miles south of Burney Falls and 1.5 miles south of Salmon Springs, compared to other currently proposed projects in the Burney Basin. As discussed in Comment II.B.1 and shown on Table 4, the cone of depression from the project's pumping encompasses these and other springs. Therefore, the project is more likely to result in significant impacts to this important spring resource than other, more distant projects. 14-36

The DEIR failed to evaluate the impact of project pumping on flow at Burney Falls and in other nearby springs. The cross sections in Figures 1 and 2 show that groundwater pumped by the project would otherwise discharge through springs in the area, demonstrating that project pumping will impact Burney Falls and other local springs. The springs in the project area were

[29] Timothy P. Rose, The Origin of Groundwater Discharge at Burney Falls, Shasta Co., California, Lawrence Livermore National Laboratory Report UCRL-ID-137488, February 2000.

surveyed, characterized, and their flows measured as part of the Section 7 consultation for the proposed Three Mountain Power project. The results of this survey are included in Exhibit 13 and relied on in the following analysis.

The project could pump up to 133 million gallons per year, which is equal to about 410 acre-feet per year ("AFY") of groundwater. The spring survey in Exhibit 13 indicates that there are three springs in the project area that have low flows and thus could be severely impacted by project pumping. These include Rim of the Lake Spring (2,891 AFY), about 1.5 miles north of the project site, Sand Pit Road Spring (7 AFY), about 2 miles southeast of the site, and Rocky Ledge Spring (723 AFY), about 3 miles south of the site.

The drawdown cone of depression formed by pumping the project well extends to these springs. For example, the drawdown at 2 miles from the project well would be about 1 foot after 10 years of pumping at 770 gpm, 3.7 feet after only 1 year of pumping at 4,000 gpm, and 5.5 feet after 1 year of pumping at 6,000 gpm (Table 4). Assuming that the water pumped by the project would otherwise discharge at these springs, pumping 410 AFY could reduce the flow at these springs by 12% to 100%, potentially drying up smaller springs such as Sand Pit Road Spring. Even assuming the project only used 63 AFY (Table 2), it could still dry up the smaller of these springs. This is a significant impact of the project that was not discussed or evaluated in the DEIR. (DEIR, p. 4.7-8.) Because project impacts are significant, cumulative impacts by definition are significant.

Project pumping could also impact larger springs in the area, including Salmon Springs and Burney Falls. The measured flow at Salmon Springs West in June 2000 was 14,500 AFY. (Exhibit 13, Table 3-8.) The discharges of large springs in this area decreased by 65% during the 1987 to 1992 drought. (Rose et al. 1996,[30] p. 214.) Therefore, the flow at Salmon Springs West during a similar 5-year drought would be about 9,400 AFY. Assuming that 100% of the project's pumping came from this spring, the project could reduce the flow of Salmon Springs West by about 4%.

Cumulative impacts would be even larger. Assuming that the existing on-site well, which has a capacity of 6,000 gpm, is pumped throughout the construction season, 16 hours per day for 180 days, 3,180 AFY of water would be pumped. This could reduce the flow at Salmon Spring West by up to about 34% 3180/9400). Similarly, the project could reduce the flow of Salmon Spring East (Exhibit 13, Table 3-8) by about 2% and cumulatively could reduce its flow by up

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[30] T.P. Rose, M.L. Davisson, and R.E. Criss, Isotope Hydrology of Voluminous Cold Springs in Fractured Rock from an Active Volcanic Region, Northeastern California, Journal of Hydrology, v. 179, 1996, pp. 207-236.

to about 68%. These are large reductions and are significant according to the DEIR's criteria. (DEIR, p. 4.7-8, #2.)

Burney Falls, a unique natural feature of the area, was established in 1920 as the McArthur-Burney Falls Memorial State Park and today attracts about 210,000 visitors per year. Burney Falls is the major discharge point for both surface and ground water from the Burney Basin as well as some water from the adjacent Hat Creek drainage. Water plunges over the rim of a 110-foot high escarpment and from a line of springs in the face of the escarpment at the contact between Quaternary and Pliocene basalts, into a plunge pool at the base of the Falls and continues on to Lake Britton in the Hat Creek drainage. The project's pumping could also affect the flow over the Falls, which is a primary aesthetic feature of the Falls that attracts visitors.

The lowest flow measured at Burney Falls, 88,200 AFY, was recorded by the California Department of Fish and Game ("DFG") in July 1994. (Exhibit 14.) Of this, 72% flowed over the rim as a waterfall and 28% flowed from a line of springs in the face of the escarpment. Project pumping could reduce the flow over the rim by up to 0.6%. Cumulative impacts would be higher, up to 5% (3,180/63,500) assuming the on-site well is pumped at 6,000 gpm for the 180-day construction period.

Historic precipitation and streamflow data for the region indicate that a significant drought occurred from approximately 1915 to 1934. This approximately 20-year drought far surpassed the length of the 5-year 1987-1992 drought evaluated above. During a prolonged drought, groundwater is released from storage without being replenished by significant recharge. The low-flow recession curve for Burney Falls in Figure 4 indicates that a drought similar to the one that occurred between 1915 and 1934 would have diminished the flow at Burney Falls from an average of about 180 cfs to about 60 cfs or to 33% of the average. At the end of a 20-year drought, about 43,400 AFY would discharge at Burney Falls, of which 72% or 31,200 AFY would flow over the rim as a waterfall and the balance would discharge along the spring line.

The on-site wells pump from the same aquifer that supply Burney Falls (Figures 1, 2). Therefore, project pumping would reduce flow over the rim by about 1% (410/31,200). Cumulative impacts, assuming the on-site well is pumped at 6,000 gpm, 16 hours per day for the 180 day construction period, would reduce the flow over the rim by 10% (3,180/31,400). These reductions could be judged as a significant aesthetic impact by custodians of the State Park system and visitors because Burney Falls is an important recreational area noted for its natural beauty and uniqueness.[31]

II.B.4 Project Pumping Could Endanger The Shasta Crayfish

The springs in the Hat Creek drainage, some of which could be significantly impacted by nearby project pumping, provide habitat for the federally- and state-listed endangered Shasta crayfish, the only extant species of crayfish endemic to the state of California. The author of the Habitat Recovery Plan for this species recently concluded that the pumping from another proposed project would significantly impact this species. (Exhibit 15.) Therefore, project pumping, particularly due to its proximity to this critical habitat, would also be significant. 14-37

II.C STORMWATER RUNOFF IMPACTS

Stormwater runoff from rock quarries, such as proposed here, is normally very turbid and muddy. (Exhibit 16.) Therefore, the runoff is usually detained and the sediment removed by settling before the runoff is allowed to discharge from the site. The information on stormwater runoff in the DEIR and other documents is ambiguous and requires clarification.

The project description states that two retention basins would be used to retain all runoff from quarry and plant operations. (DEIR, p. 3-16.) However, the hydrology and water quality section states that stormwater runoff from the commercial-light industrial zone would flow northward and be intercepted by a drainage ditch that then flows eastward (DEIR, p. 4.7-1), suggesting it drains offsite. The composition of this stormwater runoff and the ultimate discharge point for the ditch are not identified. Therefore, it is impossible to determine the impacts of this runoff. 14-38

The hydrology and water quality section also states that most of the runoff within the Reclamation Plan area flows to an existing pond. (DEIR, p. 4.7-1.) The DEIR does not discuss the disposition of this runoff. However, the Reclamation Plan elaborates, pointing out that most of the site runoff collects in a depression in the former plywood pond, proceeding along the northern side of the old log pond and continuing north and northwest, presumably off the site, appearing to contradict the claim that all runoff from process areas is retained onsite. (Reclamation Plan, p. 16.)

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[31] Letter from David A. Nelson, Park Superintendent, Dept. of Parks and Recreation, November 16, 1999.

Therefore, it appears that some muddy runoff from the site could be discharged off site. The DEIR should be revised to explicitly discuss the ultimate disposition of stormwater runoff from all portions of the site that would be impacted by the project and to evaluate the environmental impacts of this runoff.

II.D WASHWATER SHOULD BE RECYCLED

The project would use up to 86 million gallons of potable domestic water per year to wash aggregate (Table 3). The sediment-laden washwaters would be discharged to retention ponds where they would be evaporated. This is an unreasonable use of water under the California Water Code.

Water Code sections 13550, 1351, 13552.6, and 13552.8 find the use of potable domestic water for nonpotable purposes, including general industrial uses (Water Code § 13550(a)), is a waste or an unreasonable use of water if recycled water is available and meets four criteria:

1. recycled water is available and the quality is adequate for the proposed use (Water Code §13550(a)(1));
2. recycled water can be furnished at a reasonable cost and the cost of supplying treated recycled water is comparable to or less than the cost of supplying potable domestic water (Water Code §13550(a)(2)); 14-39
3. the use will not be detrimental to public health (Water Code §13550(a)(3), 13552.8(a)(3));
4. the use will not adversely affect water rights, water quality, or plantlife, fish, and wildlife (Water Code §13550(a)(4), 13552.8(a)(2)).

Water Code § 13050(n) defines "recycled water" as "water which, as a result of treatment of waste, is suitable for a direct beneficial use." Water Code § 13050(d) defines "waste" as "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation." Under these definitions, the discharged washwater could be settled to remove sediment and recycled for dust control elsewhere on the site. The DEIR should be revised to evaluate the impact of these Water Code sections on the project.

II.E SEWAGE DISPOSAL

The DEIR indicates that sanitary wastewater would be disposed in an existing on-site septic tank/leachfield system. (DEIR, p. 3-18, Fig. 3-5B.) The project represents a significant expansion of operations at the site. Improperly 14-40 designed and overloaded septic/leachfield systems are a common cause of groundwater contamination in the area. The DEIR does not discuss or evaluate the adequacy of the existing facilities, whose capacity may be exceeded by the proposed expansion. The DEIR should be revised to consider this issue.

II.F BLASTING MAY RELEASE GROUNDWATER

The DEIR discussed the potential impact of blasting on groundwater *beneath* the site. This discussion assumes that the ore body itself is dry. (DEIR, p. 4.7-12.) However, former employees claim that there are springs and seeps in the fault scarp that is proposed for quarrying. This is consistent with hydrology in faulted areas. The Burney Basin is dissected by a number of north-northwest striking fault systems.[32] The fault proposed for quarrying is a Holocene-active fault, informally referred to as the "Old Lumber Mill fault." This fault has an antithetic relationship to the Rocky Ledge fault.

Faults cause discontinuities in rock sequences and thus control groundwater flow. They may act as conduits or barriers to groundwater flow. Fault zones may have open fractures, allowing rapid infiltration of precipitation, or fractures sealed by mineral precipitation, fault gouge or weathering, preventing flow. A fault may also place high-conducting aquifer rocks against impervious rocks, causing water to rise along the fault zone, forming springs. (Mazor 1997,[33] pp. 54-55.) 14-41

I am not aware of any water level data east of the fault that could be used to evaluate this issue. However, if the fault forms a groundwater barrier, as is common, and there is groundwater within the ore body, or east of the ore body, quarrying the fault scarp could remove this barrier, releasing large quantities of groundwater and resulting in flooding. This occurred recently in Carson City, Nevada, with significant adverse consequences. The fault scarp should be inspected during wet conditions for springs and seeps. At least four piezometers should be placed within the ore body to evaluate whether the ore body contains groundwater and/or acts as a fundamental groundwater barrier.

III. TRAFFIC

The DEIR estimated the increase in traffic due to the project. (DEIR, Appx. A.) However, it failed to evaluate the impact of this increase on level of

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[32] T.L. Sawyer, Quaternary Fault Map of the Pit River Region, project No. 502-22; T.L. Sawyer, Quaternary Faults of the Modoc Plateau, Southern Cascade Range Borderland, Figure 1

[33] Emanuel Mazor, Chemical and Isotopic Groundwater Hydrology, 2nd Edition, Marcel Dekker, Inc., New York, 1997.

service and wear of local roads. The DEIR also underestimated traffic volumes, which were used in the air quality and noise analyses.

III.A TRAFFIC VOLUMES ARE UNDERESTIMATED

Accurate traffic volumes are essential to estimate noise impacts from trucks and other vehicles, public health impacts from diesel exhaust emissions, and air quality impacts from vehicle emissions. The DEIR estimated that the project would increase daily traffic volume by an average of 170 trips per day and a maximum of 621 trips per day. (DEIR, Table A-1.) This is a substantial underestimate for two reasons.

First, the DEIR made a number of incorrect assumptions that underestimate traffic volume. These are discussed below. In addition, the DEIR did not estimate traffic volume for the design capacity of the plant. A more realistic estimate of the average daily traffic volume based on the project described in the DEIR is presented in Table 5. These estimates indicate that the project would increase traffic by an average of 858 trips per day and a maximum of 3,240 trips per day. The increase in traffic if the installed equipment operates at design capacity is also summarized in Table 5. This table shows that the project could increase traffic up to 5,463 trips per day. Therefore, the DEIR has underestimated traffic by factors of about 6 to 32. The following sections discuss the basis for the traffic estimates presented in Table 5. 14-42

III.A.1 Concrete Plant

The DEIR estimated that the concrete batch plant would generate 14 truck trips to export concrete and 2 truck trips to import raw material per day, based on producing about 8,000 cubic yards of concrete per year and operating 210 days per year. (DEIR, Appx. B, p. A-1.) However, as discussed in Comment I.A.3, the design capacity of the proposed equipment is 200 cubic yards per hour and the proposed operating hours are 4 AM to 8 PM. (DEIR, p. 3-14.) Assuming the plant operates at design capacity and uses 6 cubic yard trucks to haul the concrete to market and 25 ton trucks to import raw material, it would take 1,067 truck trips to export the concrete,[34] 62 truck trips to import cement,[35] and 146 14-43

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[34] Number of concrete plant truck trips at design capacity = [(200 yd^3/hr)(16 hr/day)/(6 yd^3/truck)]x(2 trips/truck) = 1067 truck trips/day.

[35] Number of truck trips to import cement for concrete plant = [(200 yd^3/hr)(16 hr/day)(0.16)(1.5 ton/yd^3)/(25 ton/truck)](2 trips/truck) = 61.4 truck trips/day. Fraction of total mix that is cement (0.16) and material density from DEIR, Appendix B, p. A-1.

truck trips to import sand.[36] Therefore, the total number of truck trips to operate the concrete batch plant at design capacity would be 1,275.

III.A.2 Asphalt Plant

The DEIR estimated that the asphalt plant would generate an average of 12 truck trips and a maximum of 324 truck trips. (DEIR, Appx. B, Table A-1.) There are two problems with this estimate.

First, it is based on the wrong truck capacity. Truck volume was estimated by assuming that the asphalt plant would produce 93.8 tons per day of hot mix asphalt, which would be hauled using 25-ton and 12-ton capacity trucks. The calculations arbitrarily assume all 25-ton trucks, using 12-ton trucks only to make up the remainder. (DEIR, Appx. B, p. A-2.) Generally, 10-ton trucks are used to estimate truck traffic from asphalt plants. See, for example, the attached traffic study prepared for the owner of an asphalt plant by a traffic engineering firm. (Exhibit 17.) The majority of the loads in Shasta County are about 10 tons each. Assuming 100% 10-ton loads, the average number of truck trips would increase from 12 to 21 trips per day and the maximum would increase from 324 to 774 trips per day,[37] assuming the DEIR's estimate of trips to import raw material 14-44

This is justified because smaller trucks and/or smaller loads are more commonly used to haul asphalt to paving sites. According to CalTrans, smaller loads are used throughout Shasta County, except for very large jobs. Further, if larger capacity trucks are used to estimate traffic volume, the use permit and EIR mitigation conditions would have to limit the truck mix that could service the site, which would require burdensome mitigation monitoring conditions. Therefore, CEQA analyses are typically based on worst-case conditions, or 10-ton loads in this case.

Second, the traffic volume estimate does not include any truck trips for importing asphalt, which is required to make hot mix asphalt. In fact, the entire DEIR is silent on the source of the asphalt and how it would be transported to the site. There are no local sources of asphalt, which typically comes directly

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[36] Number of truck trips to import sand for concrete plant = [(200 yd³/hr)(16 hr/day)(0.38)(1.5 ton/yd³)/(25 ton/truck)](2 trips/truck) = 145.9 truck trips/day. Fraction of total mix that is cement (0.16) and material density from DEIR, Appendix B, p. A-1.

[37] Average asphalt plant trips assuming 10 ton/load = (93.8 ton/day)/(10 ton/truck)(2 trips/truck) + 2 trips for raw material = 21 trips/day. Maximum asphalt plant trips = (3,750 ton/day)/(10 ton/truck)(2 trips/truck) + 24 trips/day for raw material = 774. Weights and trips to haul material from DEIR, pp. A-2 and A-3. Raw material trips from DEIR, Appx. B, pp. A-2/3.

from a refinery or terminal. According to paving firms in the area, the closest sources are Paramount Petroleum's terminal in Elk Grove, which imports asphalt from the South Coast, a terminal in Klamath Falls that imports asphalt from Madras, Oregon, and the Equilon and Huntway Refineries in the Bay Area. Asphalt can be transported to the site in either standard 25-ton tanker trucks or 90-ton rail cars. The DEIR does not mention that rail transport would be used for any raw materials. Therefore, we assume asphalt would be transported to the site in tanker trucks.

Typically, asphalt comprises 5% to 10% of the total weight of the mix.[38] An average of about 750 to 1,500 tons of asphalt would be required to supply the project described in the DEIR[39] and up to 7,500 to 15,000 tons per year to supply the plant operated at design capacity. (Comment I.A.4.) Assuming that the asphalt is hauled to the site in 25-ton tankers, an average of about 60 to 120 tanker trips and a maximum of 600 to 1,200 tanker trips per year would be required to import the asphalt. Assuming the plant operates 160 days per year (DEIR, Appx. B, p. A-2), this amounts to an average of up to one tanker truck trip every other day during the 160 days[40] when the asphalt plant is operating and a maximum of up to 8 tanker truck trips every day in the maximum case. This increases asphalt plant truck trips from 12 trips to 22 (21+1) trips in the average case and from 324 to trips 782 (774+8) in the maximum case. (Table 5.)

Assuming the asphalt plant operates at design capacity, or 450 ton/hr for 16 hours per day (Comment I.A.4), it would take 1,440 tanker trips to transport the hot mix asphalt to market.[41] In addition, 64,800 to 129,600 tons of asphalt oil would be required to make this hot mix asphalt. This would require 5,184 to 10,368 tanker trips per year or 29 to 58 tanker trips per day during the 180 day

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[38] Asphalt Institute, The Asphalt Handbook, Manual Series No. 4 (MS-4), 1989.

[39] Amount of asphalt = (10,000 yd^3)(1.5 ton/yd^3)(0.05) = 750 ton/yr assuming 5% is asphalt and (10,000 yd^3)(1.5 ton/yd^3)(0.10) = 1,500 ton/yr assuming 10% asphalt. Assuming the DEIR's maximum claimed production, the amount of asphalt = (100,000 yd^3)(1.5 ton/yd^3)(0.05) = 7,500 ton/yr assuming 5% is asphalt and (100,000 yd^3)(1.5 ton/yd^3)(0.10) = 15,000 ton/yr assuming 10% asphalt.

[40] The DEIR assumes a 160-day construction period, from April through October, less Sundays, holidays, and some Saturdays. (DEIR, p. 3-14, Appx. B, p. A-2.) The DEIR also uses a 120-day construction period to calculate air emissions. (DEIR, Appx. C.) However, as noted in Comment I.A, there are actually 180 days in this season. Therefore, when revising the DEIR's calculations, the 160-day period is retained. However, when calculating plant capacity, the 180-day estimate is used.

[41] Tanker trips at design capacity to export hot mix asphalt = [(450 ton/hr)(16 hr/day)/(10 ton/truck)](2 trips/truck) = 1,440 tanker trips.

construction season.[42] Therefore, it would take 1,469 to 1,498 tanker trips to support the asphalt plant described in the materials submitted to the SCAQMD.

Finally, the DEIR's estimate does not include any truck trips for importing fuel oil. The project description states that the asphalt plant would be fueled on natural gas. (DEIR, p. 3-15.) However, the air emissions were estimated assuming the plant would use fuel oil (DEIR, Appx. C, Table 4-6[43]) and the vendor specifications note that the drum mix asphalt plant would use a "oil/gas burner assembly." (Exhibit 3.) Therefore, one or more fuel oil storage tanks would be required.

III.A.3 Other Industrial Trucks

The DEIR estimated that an average of 15 and a maximum of 60 truck trips per day would be required to export base rock, leach rock, aggregate for concrete and asphalt, and shoulder backing. (DEIR, p. 3-13.) The DEIR does not explain the basis for this estimate, but, presumably, it is based on the assumption that the quarry would only produce 30,000 cubic yards of aggregate per year. As discussed in Comment I.A.1, the Reclamation Plan indicates that the quarry could produce as much as 3.0 million cubic yards of crushed rock material, or 100,000 cubic yards per year. Therefore, the truck traffic to export these material would be proportionately higher, or an average of 50 truck trips and a maximum of 200 truck trips. 14-45

III.A.4 Commercial-Light Industrial

The project includes a concrete trailer rental facility, a landscaping materials outdoor sales area, and a truck repair shop for vehicles owned by Hat Creek Construction. The DEIR estimates that these three uses would generate an average of 47 trips per day and a maximum of 70 trips per day, using assumptions that are purely arbitrary. (DEIR, Appx. B, pp. A-3/4.) The actual trip generation for these uses is substantially higher, as demonstrated below. 14-46

The applicant has applied to rezone 24 acres of the site from general industrial (M) to commercial-light industrial (C-M). (Exhibit 11.) The proposed three uses are classical light industrial uses. Trip generation for these types of uses are normally estimated using the Institute of Transportation Engineers

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[42] Tanker trips at design capacity to import asphalt = [(64,800 ton/yr)/(180 day/yr)(25 ton/truck)](2 trips/truck) = 28.8 tanker trips.

[43] All of the emission factors used to calculate emissions from the asphalt plant in Table 4-6 are for fuel oil, not natural gas. For example, see AP-42, Table 11.1.8 and Exhibit 28, Asphalt Concrete Plant Source Test Data Summary, September 3, 1993.

("ITE") standard reference work, *Trip Generation*.[44] This reference work includes trip generation data for "general light industrial" uses, expressed as number of trips per day per developed acre. Appropriate excerpts from this reference is included here in Exhibit 18.

The DEIR indicates that 24 acres would be devoted to these three uses. (DEIR, Table 3-1.) The applicant's employee count of only 5 to support these uses is not consistent with the acreage that is devoted to those uses. The project description indicates that 59% of this area would be allocated for the truck repair shop and the balance for other uses.[45] If we assume that the truck repair shop only services on-site trucks owned by Hat Creek Construction and thus would not attract any commercial clients, then 59% of the 24 acres or 14 acres would be conventional light industrial uses (i.e., nursery and concrete u-haul rental). According to ITE, light industrial uses generate an average of 51.8 trips per acre per day and up to 159.4 trips per acre per day. (Exhibit 18, p. 108.) Thus, the nursery which would supply landscaping materials and u-haul rental would generate an average of 725 and a maximum of 2,231 trips per day. Therefore, the DEIR underestimated trip generation for these uses by a factor of 15 to 32 and impacts that are based on trip generation, including traffic, air quality, and noise by comparable amounts. Actual trip generation for these light industrial uses could be higher than calculated here for two reasons.

First, one of the two uses is a nursery (i.e., landscaping materials). Nurseries are special cases of the light industrial category which have much higher trip generation rates than the average trip generation for light industrial. Nurseries generate 96.2 trips per acre per day or nearly twice as much as the average for light industrial uses. (Exhibit 18, p. 1299.) We do not know what fraction of the 14 acres would be devoted to nursery. However, arbitrarily assuming a 50:50 split, the trip generation rate would increase from 725 to 1,036 trips per day for the nursery and u-haul facility. The u-haul facility could generate more trips than accounted for in this estimate because each trailer would have to be returned, requiring four trips per unit rental instead of two for most light industrial uses.

Second, if the truck repair facility serviced commercial clients, the trip generation rate would also increase. The truck repair facility would occupy about 10 acres (24 ac - 14 ac). Therefore, it could generate an average of 518 trips per day and a maximum of 1,594 trips per day. This would increase the total trip

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[44] Institute of Transportation engineers (ITE), <u>Trip Generation</u>, 6th Ed, 1997.

[45] Project Information Summary from RFP states "A use permit for a 7,000 square-foot truck repair shop, and for a 10,000 square-foot outdoor area for retail sales of landscaping materials and rentals of trailers used for hauling 1 1/4 cubic yards of mixed concrete."

generation rate for light industrial uses from 725 to 1,554 trips per day (1036 + 518). The environmental impacts of the project estimated in the DEIR do not include the truck repair facility. Therefore, the use permit and EIR mitigation conditions should explicitly limit the truck repair facility to only servicing on-site Hat Creek trucks, and monitoring should be required in the Mitigation Monitoring Plan to assure that this requirement is complied with. Otherwise, the additional truck trips must be included in the analysis.

III.A.5 Employees

The DEIR estimates that the site would have an average of 25 and a maximum of 37 employees, who would generate 50 vehicle trips per day. (DEIR, Appx. B, p. A-3.) The project description in the County's files (Exhibit 11) indicate that 5 of these would work at the truck repair, u-haul rental, and nursery facilities. Therefore, the balance, or 20 to 32 employees, would work in the various aggregate processing activities.

14-47

The number of employees required to operate the facility at design capacity would be substantially larger, roughly proportional to the increase in capacity compared to the capacity evaluated in the DEIR. Conservatively assuming that employee count would increase in proportion to the increase in quarry output, or by 333% (100,000 yd^3/30,000 yd^3), it would take 67 to 107 employees to operate the equipment the applicant proposes to install. The corresponding number of employee vehicle trips would be 134 to 214 per day.

III.B TRAFFIC IMPACTS WERE NOT EVALUATED

The DEIR did not analyze traffic impacts. Instead, it included a mitigation measure (MM 4.1b) to address truck egress onto State Road ("SR") 89 and argued that the analysis in the Initial Study, included in Appendix A to the DEIR, constitutes an adequate analysis. (DEIR, p. 4.1-3.) However, the Initial Study does not contain a traffic analysis. A traffic analysis typically includes a level of service ("LOS") analysis at intersections and major roadways impacted by the project, a queuing analysis, and a project driveway analysis, among others. 14-48

III.B.1 Level Of Service

The Level of Service or LOS ratings are qualitative descriptions of traffic operating conditions along roadways and at intersections. They are reported using an "A" through "F" rating system to describe travel delay and congestion. An LOS A indicates free flow conditions with little or no delay and LOS F indicates jammed conditions with excessive delays and long backups. 14-49

The Initial Study does not contain any traffic impact analyses. Instead, it states with no support or analysis whatsoever, that SR 89, between Clark Creek Road and SR 299, is at LOS A. It then concludes the project would have to add 1,000 vehicle trips per day to drop the LOS to B, concluding traffic impacts are not significant. (DEIR, Appx. A, Initial Study, § XV(b).) Traffic impacts are not generally significant unless the LOS drops to C or lower. However, the Initial Study discussion, notwithstanding the fact that it is not adequate support for the DEIR's conclusions, does not address at all the busier intersections and roadways that would be impacted by project traffic.

A detailed traffic analysis was conducted for a portion of SR 299 that would be impacted by both this project and the proposed Three Mountain Power project. This analysis, included in Exhibit 19, evaluated the traffic impacts of the construction and operation of this power plant. This study evaluated SR 299 from Tamarack Road (located west of Burney) to Pine Street (located in Johnson Park). About 63% of the project's traffic would travel west along SR 299 to Burney, Interstate 5, or Redding (Figure 3). (Comment IV.A.3.a.)

The Three Mountain Power traffic study concluded that the LOS of this road segment is currently C. (Exhibit 19, Table 2.) The CalTrans Route Concept Report defines peak hour traffic operations that exceed an LOC of C as unacceptable for SR 299. (*Id.*, p. D-5.) An increase in average daily trips ("ADT") of 1,808 and peak hour trips of 426 (*Id.*, Table 3) was estimated to reduce the LOS from Tamarack Road to Plumas Street in Burney to E and from Plumas Street to Energy Drive to D. (*Id.*, p. D-11 and Table 5.) This was considered to be a significant impact. (*Id.*, p. D-15.)

The project could have a number of significant impacts on traffic that were not considered in the DEIR. First, the project could increase traffic in these road segments by more than the increases found to be significant in the Three Mountain Power analysis. Table 5 indicates that the DEIR's maximum revised case would increase the ADT by 3,248 trips per day, of which 63% or 2,046 would occur in the same segments analyzed in Exhibit 19. Similarly, Table 5 indicates that the design case would increase average daily traffic by 3,994 to 5,463 trips, of which 2,516 to 3,988 would occur in these impacted road segments. These ADTs are higher than those found to be significant by Three Mountain Power. Peak hourly traffic from the project would also be similar to or greater than peaks evaluated by Three Mountain Power. Therefore, the project would likewise result in a significant traffic impact in these road segments that was not discussed in the DEIR.

Second, the DEIR argues that it would take 1,000 trips to drop the LOS to B. However, much of the increase in traffic, 25% in the DEIR's average case and

70% in the DEIR's maximum case (Table 5), is large heavy duty trucks with three or more axles designed for the transport of cargo. These trucks are much longer than normal passenger vehicles. These larger vehicles take up more of the roadway and require longer queuing lanes. The DEIR did not consider the impact of these larger vehicles.

Third, the intersection of SR 89 and 299 is a potentially critical intersection that should be studied. This intersection includes a full four-way stop in all directions. About 80% of the project's traffic would pass through this intersection. When Interstate 5 is closed, traffic is routed from Mt Shasta to Burney, Redding, and points south. When this occurs, the traffic at this intersection backs up for 10 miles. This typically occurs two to three times per year. Further, a truck stop has been proposed at this intersection. The proposed truck stop would attract additional trucks to the area, increasing local congestion. Thus, cumulative traffic impacts, from the proposed truck stop at SR 89 and 299 and other currently proposed projects (DEIR, p. 4.3-15) would further aggravate traffic impacts.

Fourth, there are no traffic signals along SR 89 in the Burney Basin. The large increase in truck and other traffic along the main access route to Burney Falls State Park could interfere with peak seasonal recreational traffic and adversely impact the experience sought by visitors. The substantial increase in traffic could make it very difficult for local residents to enter and exit SR 89 and 299 and for Park visitors to turn onto SR 89 from HW 299. The DEIR should evaluate the need for traffic signals at key intersections in the project area, including at the junction of SR 89 and 299, SR 89 and the site entrance, and SR 89 and Clark Creek Road.

These significant and potentially significant traffic impacts should be quantified and mitigated. The Three Mountain Power analysis did not recommend road improvements because the impact was temporary, caused by construction traffic projected to last only about 15 months. (Exhibit 19, p. D-15.) However, here, the increase would be permanent and thus would require road improvements to alleviate local congestion, including but not limited to road widening and signalizing critical intersections. The DEIR should be revised to include a traffic analysis and the EIR recirculated.

III.B.2 Cumulative Traffic Impacts

The DEIR and Initial Study also do not discuss or evaluate cumulative traffic impacts. If the project were to commence operation before or during the construction of Three Mountain Power, the cumulative impacts would clearly be significant because the Three Mountain Power construction traffic impacts alone 14-50 are significant. Further, the increase in operational traffic from Three Mountain Power, estimated to be an average of 127 trips per day and a peak of 36 per hour (Exhibit 19, Table 3) plus other currently planned projects, would further exacerbate the impact of the project's traffic on local circulation. These cumulative impacts should be evaluated and the DEIR recirculated.

III.B.3 Road Wear

The large number of heavy trucks that would service the project would contribute to additional wear of local roads, increasing the need for regular roadway maintenance. On average, one truck has approximately the same wear and tear impact on local roads as the passing of approximately 20,000 automobiles. (Exhibit 20.)

This is normally addressed by requiring the applicant to contribute to a mitigation fund to help offset the cost of increased maintenance or requiring that the applicant itself carry out the required improvements. Such improvements
may include structural rehabilitation of the roadway, provision of wide paved 14-51
shoulders, geometric improvements at intersections, truck climbing lanes, roadway realignments, lane widening, and intersection signalization.

Sonoma County, for example, requires payment into a County traffic mitigation fund, amounting to 1.12 cents per ton, and is in the process of setting up a "road maintenance fee system." (Exhibit 20.) A recently proposed quarry expansion was required to enter into an agreement with Sonoma County for payment of the quarry's fair share cost of the total amount of the estimated improvements. The DEIR is silent on both this impact and any mitigation. Therefore, the DEIR should be revised to discuss this significant impact and to identify suitable mitigation, along the lines currently being pursued in Sonoma County.

IV. PUBLIC HEALTH

The DEIR evaluated the public health impacts of emissions from the asphalt plant and concluded that they were not significant. (DEIR, p. 4.2-12.) The DEIR did not evaluate the public health impacts of any other aspect of the project. However, there are at least two other components of the project which
typically result in significant public health impacts that were not evaluated. 14-52
There are: (1) diesel exhaust emissions from trucks used to haul the product to market and (2) crystalline silica emissions from all operations that generate fugitive dust. The impacts of truck diesel exhaust and crystalline silica are quantified below. However, other operations frequently result in significant health impacts, including construction of the project itself and off-road mobile

equipment used in quarrying and material handling within the project site. These should also be evaluated before the EIR is certified and the project is approved.

IV.A DIESEL EXHAUST IMPACTS ARE SIGNIFICANT

Project operation would expose workers, residents, and school children to elevated concentration of diesel exhaust. Diesel particulate matter ("PM") is a serious public health concern. It has been linked to a range of serious health problems including an increase in respiratory disease, lung damage, cancer, and premature death. Fine diesel particles are deposited deep in the lungs and can result in increased hospital admissions and emergency room visits; increased respiratory symptoms and disease; decreased lung function, particularly in children and individuals with asthma; alterations in lung tissue and respiratory tract defense mechanisms; and premature death. (CARB 6/98.[46]) On August 27, 1998, after extensive scientific review and public hearing, the California Air Resources Control Board ("CARB") formally identified particulate emissions from diesel-fueled engines as a toxic air contaminant. The supporting documentation is included in Exhibit 21 to these Comments.

The project would generate a large amount of truck traffic. (Comment III.A.) The noise analyses assumed that 100% of the concrete batch plant, asphalt plant, other industrial activities, and commercial-light industrial zone vehicle trips were medium to heavy duty truck trips. (Exhibit 22.) Therefore, the project evaluated in the DEIR would generate an average of 90 truck trips per day and a maximum of 502 truck trips per day. (DEIR, Appx. B, Table A-1.) The project operated at its design capacity would generate from 3,830 to 5,204 truck trips per day (Table 5.) 14-53

Residents, school children, and workers along the trucks routes used to import raw materials and export products from the site would be exposed to high concentrations of diesel exhaust. The DEIR recognized that truck traffic would generate "gaseous emissions," but it did not discuss or evaluate diesel exhaust, which is the particulate fraction of diesel emissions, nor evaluate the health impacts of these emissions. Instead, it analyzed only air quality impacts of *fugitive* dust emissions from truck traffic, which is resuspended road dust. (DEIR, p. 4.3-13.)

Most commercial trucks (except gasoline-powered pickups) and mobile construction equipment use diesel fuel. The combustion of diesel fuel in engines

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[46] California Air Resources Board (CARB), Initial Statement of Reasons for Rulemaking, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant, Staff Report, June 1998. (Exhibit 1.)

produces diesel exhaust which contains some 40 compounds that are listed by the U.S. EPA as hazardous air pollutants and by the California Air Resources Board ("CARB") as toxic air contaminants. Diesel engines produce particles at a markedly greater rate than gasoline engines, on an equivalent horsepower basis. The diesel exhaust particles are mainly aggregates of spherical carbon particles coated with inorganic and organic substances. The inorganic fraction consists of small solid elemental carbon particles ranging from 0.01 to 0.08 microns in diameter. The organic fraction consists of soluble organic compounds including aldehydes, hydrocarbons, and polynuclear aromatic hydrocarbons. These small particles are readily inhaled and a portion is trapped within the small airways and alveolar regions of the lung.

The DEIR did not discuss nor evaluate the impact of diesel exhaust on members of the public, school children, and workers along transport routes. These impacts must be evaluated to comply with CEQA. Local air districts are revising their CEQA Guidelines to explicitly recognize the need to evaluate and mitigate these impacts. The Bay Area Air Quality Management District ("BAAQMD"), for example, modified its CEQA Guidelines in December 1999 (BAAQMD 12/99[47]) to acknowledge the impact of diesel exhaust. These Guidelines (p. 47) state with respect to diesel exhaust that:

> "Because of the potential public health impacts, however, the District strongly encourages Lead Agencies to consider the issue and address potential impacts based on the best information available at the time the analysis is prepared. Particular attention should be paid to projects that might result in sensitive receptors being exposed to high levels of diesel exhaust. This applies to situations where a new or modified source of emissions is proposed near existing receptors and to new receptors locating near an existing source."

The DEIR fails to evaluate these impacts. Therefore, I have prepared a health risk assessment to evaluate the significance of health impacts caused by project traffic. As demonstrated below, project traffic would result in significant adverse health impacts to residents, workers, and school children along the major truck routes.

IV.A.1 Diesel Exhaust Risk Assessment

A health risk assessment is a method of evaluating whether an action, such as the project, would cause significant health risks. Both the U.S. EPA and 14-54

[47] Bay Area Air Quality Management District (BAAQMD), BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of projects and Plans, April 1996, Revised December 1999.

California regulatory agencies have established standard procedures for conducting health risk assessments. These guidelines outline a two-step procedure to assess health risks. First, ambient monitoring or standard regulatory models are used to estimate ambient concentrations of toxic substances that people are exposed to. Second, these concentrations are used to estimate the amount or "dose" of chemicals to which one is exposed. This dose is then used to calculate health risks. These standard procedures are used below to evaluate the cancer and noncancer health risks to residents and school children along the roadways that would be used by trucks visiting the project site.

Cancer and noncancer health risks were estimated using standard procedures outlined in guidance provided by the Office of Environmental Health Hazard Assessment ("OEHHA") (CAPCOA 10/93[48]), the Department of Toxic Substances Control ("DTSC") (DTSC 7/92[49]), and the U.S. Environmental Protection Agency ("EPA") (EPA 12/89;[50] EPA 6/95[51]), as well as the California Code of Regulations, Title 22, Section 12721.

I calculated the health risks for inhalation, the only significant route of exposure for diesel exhaust, for both adults and children. The procedures I used are summarized below.

IV.A.2 Risk Calculations Procedures

Cancer and noncancer chronic health risks are estimated for adult and children who live and/or work along the truck routes and children and teachers at the Mountain Christian Academy. The methods used to make these calculations are described below.

IV.A.2.a Cancer Risk

Cancer risk is expressed in terms of the probability of a person contracting cancer for a given exposure. It is typically defined as the number of additional cancers per million people exposed. If one million people are exposed to a

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48 California Air Pollution Control Officers Association (CAPCOA), Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines, October 1993.

49 Department of Toxic Substances Control (DTSC), Supplemental Guidance for Human Health Multimedia Risk Assessment of Hazardous Waste Sites and Permitted Facilities, July 1992.

50 U.S. Environmental Protection Agency, Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Interim Final, Report EPA/540/1-89/002, December 1989.

51 U.S. Environmental Protection Agency, Exposure Factors Handbook, Report EPA/600/P-95/002A, June 1995.

carcinogen and one person contracts cancer, the risk is stated as one in one million or $1x10^{-6}$ or 0.000001 or 0.0001%. These are equivalent ways of expressing the same thing.

The cancer risk is calculated by multiplying the lifetime average daily inhalation dose ("LAAD") by the inhalation slope factor ("SF"):

$$\text{Cancer Risk} = \text{LAAD} \times \text{SF} \times X_n \quad (4)$$

where X_n is the fraction of trucks present in each road segment n. The inhalation dose is the amount of diesel exhaust that is inhaled, averaged over a lifetime, and the inhalation slope factor is the risk per milligram of diesel exhaust inhaled per day per unit body weight, expressed as 1/(mg/kg-day).

The inhalation dose is calculated from:

$$D_n = (C \times CF \times IR \times EF \times ED \times ET \times TCF)/(BW \times AT) \quad (5)$$

where **C** is the concentration of diesel exhaust in $\mu g/m^3$, **CF** is the conversion factor from $\mu g/m^3$ to mg/m^3, **IR** is the inhalation rate in m^3/day, **EF** is the exposure frequency in days per year, **ED** is the exposure duration in years, **ET** is the exposure time in hours per day, **TCF** is the time conversion factor, **BW** is the body weight in kg, and **AT** is the averaging time. Actual project conditions were used where available and, otherwise, standard regulatory default values were used for all of these variables.

The significance threshold for cancer risk for most state and federal risk policies and for purposes of CEQA typically ranges from one in one million (0.0001% or $1x10^{-6}$) to ten in one million (0.001% or $1x10^{-5}$). Both U.S. EPA and the California Department of Toxic Substances Control ("DTSC") commonly use a risk level of one in one million to establish site cleanup standards for residential uses. CARB has adopted risk assessment guidelines that recommend the use of toxics best available control technology ("TBACT") for any new source that results in a cancer risk greater than or equal to one in one million.[52] The DEIR incorrectly states that "CARB's Risk Management Guidelines do not require any mitigation of toxic air pollutant if cancer risks are below 10 cancers per million," in direct contradiction to the actual policy. (DEIR, p. 4.3-6.) Excerpts from those guidelines are included in Exhibit 23. Shasta County has not adopted significance criteria for cancer risk. (DEIR, p. 4.3-6.) Therefore, I selected a significance threshold of one in one million for this work.

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[52] California Air Resources Board (CARB), Risk Management Guidelines for New and Modified Sources of Toxic Air Pollutants, July 1993.

IV.A.2.b Noncancer Chronic Health Risk

The noncancer chronic risk is calculated here using the "hazard index" approach recommended by OEHHA. The hazard index ("HI") is the ratio of the annual average concentration of diesel exhaust PM10 (**C**) to the chronic reference exposure level (**REL**):

$$\text{Hazard Index} = C/REL \tag{6}$$

The chronic reference exposure level is the concentration at or below which no adverse health effects are anticipated in the general human population and is based on the most sensitive relevant adverse health effect reported in the literature. RELs are designed to protect the most sensitive individuals in the population by including margins of safety. The chronic REL for diesel exhaust is 5 $\mu g/m^3$. (Exhibit 21.)

The significance threshold for noncancer risk is almost universally a hazard index equal to or greater than one. Therefore, I have used a hazard index of one as the chronic significance threshold in this work.

IV.A.3 Exposure Assumptions

The assumptions used to calculate cancer and noncancer risk, as expressed by Equations (1) and (2) above, are discussed below.

IV.A.3.a Sensitive Receptors

The project site is shown in Figure 3. Trucks enter and exit the project site onto SR 89. The project traffic was assigned to the adjacent roadway system based upon existing travel patterns, the geographical location of the proposed project in relation to the existing roadway system, and potential job sites and travel opportunities in the vicinity of the proposed project. The individuals who live and work along the road segments used by these trucks would be exposed to increased concentrations of diesel exhaust. 14-55

This information indicates that project traffic would be distributed as shown on Figure 3. About 80% of the project traffic would travel south on SR 89 and about 20% north. The Burney Falls Trailer Park is opposite the site, about 280 feet west of SR 89. It has a permanent population of 26 and rents 15 spaces to vacationers, for a peak seasonal population of up to 45 additional people per day. Based on windshield surveys, there are also several residences near the intersection of Clark Creek Road and SR 89, along both Clark Creek Road and SR

89, about 200 to 300 feet from SR 89. Scattered residences occur north of the site, east of SR 89. The land south of the site, along both sides of SR 89, until about 3 miles south of the junction of SR 89 and 299, is mostly National Forest and is not populated. However, scattered residences are present along SR 89 south of the National Forest, about 7 miles south of the site's entrance. (Figure 3.)

At the junction of SR 89 with SR 299, about 10% of the traffic continues south on SR 89 and the balance turns onto SR 299. Of the traffic turning onto SR 299, 90% travels west to Burney and Redding and 10% east to Alturas. (Exhibit 19, Table 3.) There are many residential and business properties west of this junction along both sides of SR 299, including the town of Johnson Park about 1 mile west with a population of about 1,000 and the town of Burney about 4 miles west with a population of about 3,400.[53] There are many residences in both of these communities along both sides of SR 299. There are no residential properties east of the junction along SR 299 within the Burney Basin.

However, a private school, the Mountain Christian Academy, is located at the junction of SR 299 and Sand Pit Road (Figure 3). The playground is about 150 feet north of SR 299 and 150 feet east of Sand Pit Road. This school hosts kindergarten through grades 12 and has 76 pupils and 9 teachers. Growth is over 30% each year and anticipated to continue. Classes start in mid-August, during the height of the construction season, and continue through mid-May. Classes occur from 8:30 AM to 3:15 PM for 180 days per year. Pupils and teachers would be exposed to diesel exhaust from project sand trucks traveling along Sand Pit Road as well as east bound traffic traveling along SR 299.

Sand Pit Road itself, which is partially unpaved, would carry truck traffic between Braden Sand Pit and the project site. (DEIR, p. 3-12.) There are also about 8 to 10 residences along this road as well as the Mountain Christian Academy.

IV.A.3.b Exposure Duration

The exposure duration, ED, is the amount of time an individual is exposed to a chemical. Some agencies have historically allowed the exposure duration to be set equal to the project duration. However, here, the record is not clear on what the project lifetime would be. The use permit application for the quarry, crushing facility, asphalt plant, and cement plant state that the use permit would be for 30 years. (Exhibit 2.) However, the DEIR reports that only the quarry would have a 30-year lifetime (DEIR, pp. 2-1, 3-11) and is silent on other facilities

14-56

[53] U.S. Department of Commerce, 1990 Census of Population and Housing, Summary Population and Housing Characteristics, California, Report 1990 CPH-1-6, August 1991.

included in the project, e.g., asphalt plant, truck repair shop, nursery. Most of the truck trips generated by the quarry are internal, with only a few projected external trips ("other industrial trips," DEIR, Appx. B, Table A-1), and, therefore, quarry duration is not relevant to public health risks from external truck trips. Neither the use permit application (Exhibit 11) nor the DEIR report any lifetime for other proposed project components, including the truck repair facility, nursery, and u-haul rental facility.

The Office of Environmental Health Hazard Assessment ("OEHHA"), the state agency that establishes risk assessment procedures, normally requires a lifetime exposure duration of 70 years, regardless of the actual exposure time or project duration, due to assumptions used in developing cancer slope factors. See, for example, the excerpt from risk management guidelines adopted by the CARB Board of Directors on September 28, 2000 in Exhibit 24. Therefore, risks were calculated for both a 30-year exposure duration and a 70-year exposure duration to account for this uncertainty. Health risks are significant in both cases.

IV.A.3.c Exposure Concentration (C)

The concentration of diesel exhaust, **C**, that individuals are exposed to is required to estimate cancer and noncancer risks. Health effects of diesel exhaust are expressed in terms of particulate matter smaller than 10 microns or PM10. (Exhibit 21.) It is not possible to directly measure diesel exhaust PM in the atmosphere because there are many other sources of PM, such as wind-blown dust and resuspended road dust. However, particulate elemental carbon or "PEC" is a commonly used surrogate for diesel exhaust because it occurs at high concentrations in diesel exhaust and comparatively low concentrations in gasoline-powered vehicles[54] and other sources.

14-57

I estimated the ambient concentration of diesel exhaust from a study that I directed from March 1999 through November 1999 in which diesel exhaust was continuously monitored as PEC at a coastal site with excellent atmospheric dispersion and strong offshore winds that dispersed truck emissions. These data would *underestimate* diesel exhaust concentrations in the project area because wind velocities are lower. Further, inversions are common in the Burney Basin. The Air Quality Element of the Shasta County General Plan states: "Generally, the County experiences moderate to very poor capability to disperse pollutants nearly 80 percent of the time. This is, in large measure, due to the relatively

[54] G.R. Nueroth and R. Robbins, Differences in the Carbon Composition of Source Profiles for Diesel- and Gasoline-Powered Vehicles, Atmospheric Environment, v. 28, no. 15, 1994, pp. 2493-2505.

stable atmosphere which acts to suppress vertical air movement. Extremely stable atmospheric conditions referred to as "inversions" act as barriers to pollutants. ...Dust and other pollutants can be trapped within these inversion layers and will not disperse until atmospheric conditions become more unstable. This situation creates concentrations of pollutants at or near the ground surface which pose significant health risks for plants, animals, and people." (General Plan, p. 6.5.01.[55])

These PEC data were collected during a remediation project on the Central Coast, performed with oversight from the local air pollution control district and county health department. Medium-heavy-duty dump trucks were used to haul soil from the remediation area to a staging area about one-half mile distant. The concentration of PEC was continuously measured throughout the 10 to 12 hour workday six to seven days per week from March 1, 1999 through November 30, 1999. Measurements were made 100 to 200 feet or more from the truck corridor. An Andersen Model AE16 aethalometer was used to continuously measure PEC by optical attenuation. (Rosen et al. 1980.[56]) This instrument collects particles on a 1 cm^2 spot on a quartz fiber tape for a user-specified collection time that can range from 15 sec to 1 hr.

Particulate elemental carbon measurements were converted to diesel exhaust PM by dividing by the fraction PEC in diesel particulate matter, which ranges from 10% to 50%, based on current diesel engines and California reformulated fuel. I used the mid-point of this range, or 30%, for the calculations presented here. Therefore, the diesel exhaust PM concentration is about three times higher (1/0.3=3.3) than the measured PEC concentration. Several recent articles that document the amount of elemental carbon in the particulate fraction of diesel exhaust are included in Exhibit 25. All of the PEC data discussed in these comments are reported as diesel PM, calculated by dividing the measured PEC concentrations by 0.3.

The resulting daily average PEC data and truck counts are included in Exhibit 26 to these comments. These data indicate that there is a statistically significant relationship between the concentration of PEC in ambient air and number of trucks ($r=0.34$, $p<0.001$). On days when there were no trucks, the diesel PM10 concentration averaged 2.2 ug/m^3. Diesel PM10 concentrations generally increased as the number of trucks increased. A single truck increased ambient concentrations of PEC by an average of 0.066 $\mu g/m^3$ and each truck trip increased ambient PM10 concentrations by 0.033 $\mu g/m^3$. The equivalent 24-hour

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[55] Shasta County, General Plan, Air Quality Element, p. 6.5.012, Policy AQ-2e.

[56] H. Rosen, A.D.A. Hansen, R.L. Dod, and T. Novakov, Soot in Urban Atmospheres: Determination by an Optical Absorption Technique, Science, v. 208, May 16, 1980, pp. 741-744.

concentration is 0.016 ug/m³, obtained by dividing by two to adjust the 10 to 12 hour measurements to a 24-hour basis, assuming diesel exhaust is zero during evening and nighttime hours. The diesel exhaust concentration at various points along the truck corridor can be estimated with this unit concentration value by multiplying it by the number of truck trips that pass each location.

IV.A.4 Health Risk Results

IV.A.4.a Residents

The health risk calculations for residential properties along the truck corridors are summarized in Tables 6 (70 year exposure period) and 7 (30 year exposure period). The detailed spreadsheet calculations are included in Exhibit 27. The cancer risk is expressed as number of additional cancers per million people exposed and the noncancer chronic risk is expressed as the hazard index, calculated as shown in Equation (6). If the cancer risk is greater than one in one million, it is significant. Similarly, if the chronic hazard index (last column) is greater than one, it is also significant.

The health risks were calculated for six separate estimates of future truck traffic, as discussed in Comment III.A and summarized in Table 5: (1) the DEIR's "average" estimate as presented in Appendix B, Table A-1; (2) the DEIR's "maximum" estimate as presented in Appendix B, Table A-1; (3) the DEIR's "average" estimate, revised to correct errors as discussed in Comment III.A; (4) the DEIR's "maximum" estimate, revised to correct errors as discussed in Comment III.A; and (5) the design case, based on equipment capacity reported to other agencies, as discussed in Comment III.A. The following discussion is based on the 70-year exposure duration estimates in Table 6. The reader is referred to Table 7 for the corresponding 30-year estimates, which are lower for adults by the ratio of 30 years to 70 years or by 43%. The child risks are identical for the two cases because the lifetime of a child is 6 years, which is less than 30 years. 14-58

These calculations indicate that children who live along the major truck routes and spend 50% of their time at home from age 2 to 7 would incur a lifetime increase in the risk of contracting cancer of 4 to 38 in one million, using the DEIR's estimate of the *average* number of truck trips that would be generated by the project. The highest risks occur along the road segments with the highest increase in truck traffic, which coincide with the areas of highest population density, along SR 299 west of its junction with SR 89. This road segment would receive 63% of the project's truck traffic.

The DEIR's estimate of truck traffic is low, as discussed in Comment III.A. It is standard practice to evaluate health impacts using worst-case assumptions.

The SCAQMD, for example, explained in correspondence with the County that the DEIR should include "a screening health risk assessment based on worst-case assumptions which determines the cancer, chronic, and acute health effects of the operation phase." (Exhibit 1.) Actual cancer risks could be much higher than the *average* case evaluated in the DEIR, increasing up to 178 to 1,601 in one million for the design case. (Table 6.) All of these cancer risk estimates exceed the significance threshold of one in one million and are therefore significant.

An adult who lives along the major truck corridors and spends 50% of their time at home for 70 years will incur a lifetime increase in the risk of contracting cancer of 14 to 125 in one million, using the DEIR's estimate of the *average* number of truck trips that would be generated by the project, with the highest risk again occurring along SR 299 west of its junction with SR 89. Actual risks could be much higher than the *average* case evaluated in the DEIR, increasing up to 593 to 5,337 in one million for the design case. (Table 6.) All of these cancer risk estimates exceed the significance threshold of one in one million and are therefore significant. Similarly, all of the cancer risks assuming a 30-year adult exposure duration are likewise significant. (Table 7.)

Chronic health risks are not significant anywhere for the DEIR's average case. However, they are marginally significant for SR 299 west in the DEIR's maximum case. They are also significant for the road segments with the highest traffic volumes in the revised DEIR average and maximum cases and in the design case, except along SR 299 east of its junction with SR 89.

IV.A.4.b School Children

The cancer risk calculations for children at the Mountain Christian Academy, located at the intersection of Sand Pit Road and SR 299 east, are summarized in Table 8 under "child" for a typical exposure duration of 6 years. The detailed risk calculations are included in Exhibit 27. The cancer risk is expressed as number of additional cancers per million people exposed. Some children may be exposed for up to 13 years because this School includes kindergarten through the 12th grade. 14-59

These calculations indicate that children who spend 8 hours per day at the school for 6 years will incur a lifetime increase in the risk of contracting cancer of 2 in one million for the DEIR's average case (Hwy 299 east). This risk increases to 9 in one million for the DEIR's maximum case, to 14 in one million for the DEIR's revised average case, to 54 in one million for the DEIR's revised maximum case, and to 67 in one million for the design case. These risks are all significant.

Risks at the school could be higher. The calculations in Table 8 only include diesel exhaust from trucks traveling east along SR 299. The project would also import sand for cement and asphalt production from the Braden Sand Pit, located at the end of Sand Pit Road (Figure 3). (DEIR, p. 3-12.) These sand trucks would pass the Mountain Christian Academy en route to the project site, within 150 feet of the School, increasing the ambient diesel exhaust concentration compared to those used to calculate risks.

Chronic health risks are not significant for school children for any of the five cases that were evaluated because the hazard index is less than one (Table 8).

IV.A.4.c Workers

The cancer risk calculations for workers along major truck routes are summarized in Tables 8 and 9 under "adult." Table 8 summarizes the risk calculations for a standard default worker exposure duration of 40 years and Table 9 for the project duration of 30 years. The detailed risk calculations are included in Exhibit 27. Affected workers include those at Fletchers, adjacent to the site entrance, the proposed truck stop at the junction of SR 89 and 299, businesses in Johnson Park and Burney, and teachers at the Christian Mountain Academy (Figure 3).

A worker exposed to project truck traffic for 40 years would incur a lifetime increase in cancer risks of 4 to 37 in one million for the DEIR's average case. These risks would increase up to 176 to 1,584 in one million for the design case. These risks are all significant and remain significant if the exposure duration for the worker is lowered to 30 years, the quarry lifetime (Table 9). Cancer risks for on-site workers, who would be exposed to 100% of the off-site truck traffic plus idling emissions and emissions from off-road equipment (haul trucks, dozers, and excavators) would have higher risks than the highest values reported in Table 6. 14-60

Chronic health risks are not significant for workers under the DEIR's average case because the hazard index is less than one for all road segments. They are marginally significant for SR 299 west in the DEIR's maximum case (HI=1.01). However, they are significant for workers along road segments with the highest traffic volumes in the revised DEIR average and maximum cases and in the design case, except along SR 299 east of its junction with SR 89. The highest chronic risks to workers occur along SR 299 west, where most of the commercial development is also present.

IV.A.4.d Cumulative Health Risks

Cumulative health impacts would be even greater than estimated above. Proposed projects, identified in the DEIR, would increase truck traffic compared to current conditions. Most notably, a truck stop is proposed at the junction of SR 89 and 299, which would attract and concentrate local truck traffic in this area. The four-way stop sign at the junction likely would result in long queues of idling trucks, which would increase diesel emissions compared to the free-flow traffic case evaluated here. These impacts would also be significant. 14-61

IV.B PUBLIC HEALTH IMPACTS FROM CRYSTALLINE SILICA ARE SIGNIFICANT

Crystalline silica, also known as quartz, is a natural compound in the earth's crust and is a basic component of basalt, sand, granite, and other natural rock materials. Breathing dust containing crystalline silica causes silicosis and fibrosis, or scar tissue formations in the lungs that reduce the lungs' ability to extract oxygen from the air. There is no cure for this disease. (OSHA 1996.[57]) Dusts generated during construction and quarry operations are widely recognized as major sources of crystalline silica. (WHO 1997.[58]) The average concentration of crystalline silica in crustal material is 12 weight percent. (CARB 1997,[59] p. 304.)

The International Agency for Research on Cancer ("IARC") recently upgraded crystalline silica to its highest carcinogenic classification, as listed in California Safe Drinking and Toxic Enforcement Act. Consequently, most California aggregate producers are now required to warn employees, consumers, and neighbors of potential health hazards linked to crystalline silica.[60] The U.S. EPA has listed crystalline silica as a known human carcinogen. Finally, crystalline silica is listed by the State of California as a chemical known to cause cancer.[61] 14-62

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[57] Occupational Safety & Health Administration (OSHA), Silica Dust Exposures Can Cause Silicosis, OSHA Fact Sheets, January 1, 1996.

[58] World Health Organization (WHO), IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Silica, Some Silicates, Coal Dust and para-Aramid Fibrils, v. 68, 1997.

[59] California Air Resources Board (CARB), Toxic Air Contaminant Identification List Summaries, September 1997.

[60] California Geology, v. 53, no. 5, September/October 2000, p. 27.

[61] Office of Environmental Health Hazard Assessment, Chemicals Known to The State to Cause Cancer or Reproductive Toxicity, June 4, 1999.

The project will generate large amounts of fugitive dust that contains crystalline silica. The DEIR estimates, for example, that quarrying will generate 8.03 lb/day, crushing and screening 7.03 lb/day, the asphalt manufacturing 1.47 lb/day, and concrete manufacturing 0.3 lb/day of fugitive PM10 dust. (DEIR, Appx. C.) Actual fugitive dust emissions are substantially higher, as discussed below in Comment V.A, because the DEIR failed to evaluate its own "maximum case" as well as the design basis of the project and omitted many dust sources from its calculations. All of this fugitive dust may reasonably be expected to contain silica, which is naturally present in natural earth materials. The DEIR should have evaluated the impact of crystalline silica in these emissions on both on-site workers and the public.

CAPCOA published a unit risk factor range for crystalline silica in 1993. (CAPCOA 10/93, Table III-7.) Inhalation risks can be calculated by multiplying the unit risk factor for crystalline silica by the annual average ambient concentration of PM10, which is estimated in the DEIR. The DEIR estimated that the project would increase the annual average PM10 concentration by 13 ug/m^3. (DEIR, Table 4.3-5.) Assuming that 12% of this PM10 is crystalline silica, the annual average ambient concentration of crystalline silica is 1.6 ug/m^3. The corresponding cancer risk, assuming exposure for only 30 years, the lifetime of the project, would be 30 in one million.[62] This risk exceeds the upper end of the usual significance range of 10 in one millions and is significant. This is a significant impact that was not evaluated in the DEIR. The DEIR should be revised to include an analysis of this impact, to identify mitigation measures, and be recirculated for public review and comment.

V. AIR QUALITY

Shasta County has a number of regulations and policies on air quality impacts which the DEIR has failed to address. The project would result in exceedances of thresholds established in these regulations and policies, resulting in significant impacts that were not discussed in the DEIR and which require mitigation. 14-63
In addition, the DEIR underestimated emissions and failed to estimate emissions for the maximum case, as explicitly required by SCAQMD rules and regulations and as is standard practice in CEQA analyses. These shortcomings should be corrected and the DEIR recirculated for public review.

V.A THE DEIR UNDERESTIMATED EMISSIONS

The DEIR did not evaluate its own "maximum" case or the operational design case, which are conventionally used to estimate project emissions for both 14-64

[62] The lower end of the cancer risk range = $(13\ ug/m^3)(0.12)(0.45x10^{-4})(30\ yrs/70\ yrs) = 30.1x10^{-6}$.

CEQA and air permitting. The DEIR also otherwise underestimated air emissions by omitting numerous emission sources and making several faulty assumptions. (DEIR, Appx. C.) The differences in emissions between the DEIR's "average" case, the DEIR's "maximum" case, and the actual design basis are substantial, as demonstrated by the PM10 emissions in Table 10.

V.A.1 Maximum Emissions Were Not Evaluated

The air quality section of the DEIR is based solely on the DEIR's "average" case. This fails to comply with SCAQMD rules and regulations and standard procedures used in air quality analyses prepared for CEQA. The SCAQMD, for example, commented that the DEIR for this project should include "analyses of the *maximum* daily and annual emission rates that are projected for the construction and operational phases of the proposed project." (Exhibit 1.) Further, the District's regulations require the use of BACT when the daily "potential to emit" exceeds certain thresholds. (SCAQMD Rule 301.) The "potential to emit" is the "maximum daily capacity of an emission unit to emit a pollutant under its physical and operational design..." (SCAQMD Rule 402.d.) The DEIR has failed to identify and mitigate significant impacts by failing to perform an analysis of maximum emissions. 14-65

V.A.1.a BACT Thresholds Are Exceeded

The SCAQMD rules and regulations require the application of best available control technology ("BACT") if the "potential to emit" exceeds 25 lb/day of reactive organic gases ("ROG" or "VOC") or nitrogen oxides ("NOx"), 80 lb/day of sulfur oxides ("SO_2"), or 500 lb/day of carbon monoxide ("CO"). (SCAQMD Rule 301.) The BACT trigger levels are exceeded for VOCs, NOx, SO_2, and CO, requiring that BACT be installed. The DEIR does not contain a BACT analysis or identify BACT proposed by the applicant.

The DEIR, for example, estimated emissions from the asphalt plant assuming an annual throughput of only 10,000 cubic yards (DEIR, Appx. C, Table 4-6, note 1) while the DEIR itself estimated that the "maximum" throughput would be 100,000 cubic yards. (DEIR, p. 3-14.) The SCAQMD Rule 301 requires the use of "potential to emit" or maximum emissions to evaluate whether BACT applies. 14-66

The NOx emissions from the asphalt plant for the DEIR's estimate of maximum throughput would increase from 9.6 lb/day to 96 lb/day, exceeding the SCAQMD Rule 301 threshold of 25 lb/day and requiring the use of BACT for NOx. The SO_2 emissions from the asphalt plant would increase from 9.93 lb/day to 99.3 lb/day, exceeding the Rule 301 threshold of 80 lb/day and requiring the use of BACT for SO_2. The VOC emissions would increase from 9.2 lb/day to 92 lb/day, exceeding the Rule 301 threshold of 25 lb/day and requiring the use of BACT for VOCs. The emissions for "operational design," discussed in Comment I.A and summarized in Table 1, would be even higher, additionally triggering BACT for PM10 and CO. These are significant impacts that were not identified or mitigated in the DEIR.

The DEIR admits that "projects that exceed thresholds are required to apply Best Available Control Technology (BACT)" (DEIR, p. 4.3-10), but does not perform any analyses to determine whether the project as proposed complies with BACT or whether the project's emissions, in fact, would exceed the thresholds and therefore require BACT. The SCAQMD specifically commented that the DEIR should include "an assessment of how the proposed project will comply with all applicable District, California, and Federal air pollution control laws." (Exhibit 1.) This analysis is missing.

The DEIR does not discuss how the project would comply with applicable regulations. Further, it is evident that the project as proposed and evaluated in the DEIR does not comply. BACT, for example, for asphalt plants, is the use of natural gas for SO_2 and the use of low-NOx burners and natural gas for NOx.[63] The emissions from the asphalt plant were estimated assuming the facility would operate on fuel oil and the equipment is described as "dual fueled." The DEIR does not require the use of low NOx burners, and the project description submitted to the SCAQMD does not include low-NOx burners.

V.A.1.b Offset Thresholds Are Exceeded

Shasta County is non-attainment for the State PM10 and ozone ambient air quality standard. (General Plan, p. 6.5.02; DEIR, Appx. A, Initial Study, § III.c.) The Shasta County General Plan requires that "new projects with stationary sources of emissions of non-attainment pollutants or their precursors that exceed 25 tons per year shall provide appropriate emission offsets. A comparable program which offsets indirect emissions of these pollutants exceeding 25 tons per year from development projects shall also be utilized to mitigate air pollution impacts." (General Plan, p. 6.5.012, Policy AQ-2e.) 14-67

The SCAQMD reviewed the administrative draft of the DEIR and concluded that offsets or "no net increase" in emissions would be appropriate CEQA mitigation for this project, even though not explicitly required by District regulations. (Exhibit 1: Kussow 6/30/00.) As discussed below, the project would exceed the 25 ton/yr threshold for both PM10 and NOx for both

[63] See BACT determinations on the CARB and South Coast AQMD websites.

stationary and indirect emissions if emissions were properly calculated. Because NOx is both a PM10 and ozone precursor, both PM10 and NOx emissions must be offset. The DEIR does not require any offsets or require other mitigation to lower emissions below the offset threshold or to achieve "no net increase."

The vehicular traffic emissions were likewise estimated assuming "average" traffic from Appendix B, Table A-1. These emissions would be substantially higher for the DEIR's "maximum" case and the operational design case discussed in Comment III.A. For example, the DEIR estimated that NOx emissions from average truck and auto traffic would be 3.3 tons/yr. (DEIR, Appx. C, Table 4-9.) These emissions would increase to 29.0 ton/yr for the DEIR's maximum case and to 187 ton/yr for the operational design case discussed in Comment III.A. These emissions exceed Shasta's County significance threshold of 25 ton/yr. Similarly, PM10 emissions from vehicular traffic would increase from 0.40 ton/yr on average to 25.4 ton/yr for the operational design case (Table 10). Because Shasta County is nonattainment for both PM10 and ozone, and NOx is a precursor to both, both PM10 and NOx emissions from traffic must be offset. (General Plan, Policy AQ-2e.)

The above discussion provides only a few examples of the ways in which and the consequences of underestimating emissions. The DEIR should be revised to include estimates of maximum emissions, based on plant capacity or otherwise limited by a specific permit condition, which is identified as a mitigation measure. (SCAQMD Rule 402.d.) These revised emissions should be screened against applicable Shasta County, State, and federal regulations and appropriate mitigation recommended. The DEIR should be recirculated.

V.A.2 Emission Sources Were Omitted

There are several sources of criteria (PM10, NOx, VOCs, SO_2, CO) and toxic emissions that were not included in the DEIR's emission's inventory. These include the following: 14-68

- VOC and toxic emissions from three 20,000-gal heated asphalt storage tanks (DEIR, p. 3-15) plus associated pumps, valves and connectors;
- VOC and toxic emissions from on-site diesel and fuel oil storage tanks;
- VOC, PM10, and toxic emissions from loading hot-mix asphalt into trucks and heated silos (DEIR, p. 3-14);
- VOC, PM10, NOx, SO_2, and toxic emissions from hot oil heaters (Exhibit 3);

- PM10 emissions from haul trucks along the unpaved portions of Sand Pit Road;
- PM10 emissions from vehicles traveling along the numerous unpaved roads in the area (e.g., Black Ranch Road);
- PM10 and exhaust emissions from on-site mobile equipment, including haul trucks, caterpillars, loaders, and excavators (DEIR, p. 3-12);
- NOx, SO_2, CO, and toxics emissions from blasting (AP-42, § 13.3);
- PM10 and exhaust emissions from site reclamation;
- PM10 emissions from secondary and tertiary crushing (Exhibit 3);
- PM10 emissions from wind erosion of active and inactive storage piles (AP-42, § 13.2.5);
- PM10 emissions from dropping aggregate into trucks and storage piles (AP-42, § 13.2.4);
- PM10 from conveyor transfer points (Exhibit 3);
- PM10 emissions from unpaved active areas within the site (AP-42, § 13.2.2, 13.2.3);
- PM10 and exhaust emissions from project construction, including the natural gas pipeline (DEIR, p. 2-2).

These are all major sources of emissions from the types of facilities that are described in the DEIR, and emissions from them are typically included in emission inventories and mitigated. No mitigation has been included for these emission sources, even though the County's significance thresholds for the whole project and the asphalt plant individually are exceeded. (Comment V.A.1 and V.B.2.) The information in the DEIR is not adequate to prepare emission inventories for most of these sources. Therefore, the DEIR should be updated to include these additional emission sources and recirculated for public review. A few are discussed in more detail below to demonstrate the significance of these omissions.

V.A.2.a <u>Construction Emissions Omitted</u>

The air quality section of the DEIR does not estimate construction emissions, arguing that the project "would not involve any construction prior to the various operations at the site." (DEIR, Appx. C, p. 3.) This is not true and is inconsistent the noise section, which discusses construction noise impacts. (DEIR, p. 4.8-13.) The project includes a new natural gas pipeline to link the 14-69 project with existing PG&E facilities. Gas pipelines are normally buried, and require trenching to install. The project also includes the construction of a 7,000-square foot truck repair facility and paving (Exhibit 11), both of which would require grading. Trenching and grading generate fugitive PM10 and exhaust emissions, which must be mitigated under Shasta County's General Plan. The EPA recommends that these emissions be estimated assuming that 1.2 tons per acre per month of particulate matter would be generated, of which typically 50% is assumed to be PM10. (AP-42,[64] § 13.2.3.) Assuming no more than 4 acres are disturbed would generate more dust in one month than the entire project in one year (Table 10).

V.A.2.b Asphalt Plant Emission Sources Omitted

The DEIR estimated emissions from the asphalt plant for a single source, the dryer, using source test data supplied by the SCAQMD. (Exhibit 28.) The emission sources at a hot-mix asphalt plant, such as proposed here, include the dryer, loading of asphalt into trucks and silos, raw asphalt storage, fumes from loaded trucks, and fugitive dust emissions from handling aggregate. (Exhibit 29.) The emissions from a typical 200,000 ton/yr batch asphalt plant, similar to the 160,000-ton/yr plant proposed here, is presented in Table 2 of Exhibit 29. This table shows that these other sources contribute substantially to VOCs, which are ozone precursors. 14-70

V.A.2.c Blasting Emissions Omitted

Blasting can be a major source of CO, NOx, and SO_2. The quarry could produce up to 200,000 tons per year of rock (Table 1), which would be loosened from a basalt ledge by blasting up to six times per year. (DEIR, p. 3-12.) The DEIR includes fugitive dust PM10 from blasting, but does not include criteria pollutants released in the hot blast gases.

The DEIR does not indicate either the type or amount of blasting agent that would be used. However, ammonium nitrate-fuel oil or ANFO is one of the most commonly used products in quarry blasting. ANFO generates 67 pounds per ton of explosive of CO, 17 pounds per ton of NOx, and 2 pounds per ton of SO_2. (Exhibit 30.) Other explosives, such as dynamite, generate even larger quantities of criteria pollutants. Blasting agents also release toxic gases, including cyanides, ammonia, and hydrogen sulfide. 14-71

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[64] U.S. EPA, Compilation of Air Pollutant Emission Factors. Volume I: Stationary Point and Area Sources, 5th Ed, Report AP-42, January 1995.

V.A.3 Erroneous Assumptions

The DEIR also underestimates emissions by making a number of unsupported and erroneous assumptions. These are discussed below for each affected industrial operation.

V.A.3.a Quarry Operations

Fugitive PM10 emissions from quarry operations are estimated for excavation, blasting, and loading/material handling. (DEIR, Appx. C, Table 4-4.) The DEIR claims that the emission factors for excavation and blasting are taken from AP-42, Tables 11.1-5, 11.1-8 and Section 13.2-4. However, this is clearly wrong. Tables 11.1-5 and 11.1-8 are both captioned "Emission Factors for Drum Mix Hot Mix Asphalt Plants" and have nothing to do with quarry operations. There is no "Section 13.2-4" in AP-42. Section 13.2 is a general discussion of fugitive dust sources and contains no emission factors. Section 13.2.4 is captioned "Aggregate Handling and Storage Piles." However, it does not contain any emission factors for excavation or blasting. These sections of AP-42 are found on the EPA website.[65]

Quarrying emissions are normally estimated using AP-42, Section 11.9, Western Coal Mining,[66] which is included here in Exhibit 30. The emission factors used in the DEIR for excavation and blasting are also not supported by this section. In fact, this section shows that there are many more emission sources in a quarrying operation than claimed in the DEIR, e.g., drilling, haul trucks, overburden removal and replacement. Further, this section indicates that quarrying emissions are substantially higher than those calculated in the DEIR, e.g., compare the emission factors in Table 11.9-2 (Exhibit 30) with those used in the DEIR, Appendix C, Table 4-4. For example, truck loading, assuming a moisture content of 10%, emits 0.011 lb/ton of PM10, compared to the DEIR's estimate of 0.0024 lb/ton. Bulldozing overburden, assuming a moisture content of 10% and a silt content of 5%, emits 0.3 lb/ton of PM10, compared to 0.0024 lb/ton assumed in the DEIR. 14-72

Finally, the DEIR inappropriately used a "loading/material handling" emission factor reported by the SCAQMD for rock crushing and screening, not quarrying. In material processing and handling operations, *each* transfer step generates emissions. There are many more transfer steps in quarrying than in

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[65] See www.epa.gov/ttn/chief/ap42supp.html and www.epa.gov/ttn/chief/ap42ch11.html.

[66] See, for example, Bureau of Land Management, Soledad Mountain Project, Mojave, Kern County, California, Draft Environmental Impact Report/Environmental Impact Statement, v. 4, May 1997, Appendix E.

rock crushing and screening. The transfer steps in quarrying are shown in AP-42, Table 11.9-2 (Exhibit 30) and include bulldozing, scraping, grading, truck loading, truck hauling, and truck dumping. Rock crushing and screening, on the other hand, only requires a single material handling step, transferring the rock and aggregate from surge piles into the primary crusher.

The DEIR should be revised to support its claimed emission factors for excavation and blasting. Quarry emissions should be revised to include all of the sources of emissions, as shown in AP-42, Section 11.9. The DEIR should be revised and recirculated.

V.A.3.b Asphalt Plant

The DEIR estimated PM10 emissions from the asphalt plant using an emission factor of 0.0082 lb/ton from AP-42, Table 11.1-5. However, Table 11.1-5 indicates that this emission factor is for a baghouse controlled, natural-gas fired plant. All other criteria pollutants emissions from the asphalt plant were estimated in the DEIR assuming that the plant would burn fuel oil. The PM10 emission factor for the same plant using fuel oil is 0.031 lb/ton or nearly four times higher. If the plant would burn fuel oil, or is proposed as a dual-fuel plant, the fuel oil emission factor should be used. 14-73

The DEIR used emission factors for CO, NOx, SO_2, and TOC from a summary of source test data supplied by SCAQMD. (Exhibit 20.) The emission factors in the DEIR are taken from this summary for a unit fired on "FO2," which is fuel oil number 2. Therefore, the DEIR's calculations of PM10 emissions, which are based on natural gas, and NOx, CO, SO_2 and TOC, which are based on fuel oil, are inconsistent. The DEIR should clarify which fuel would be used and revise the emission calculations accordingly.

V.A.3.c Vehicular Traffic

The vehicular traffic emissions appear to have been underestimated due to improper emission factors, truck distribution, and trip length.

Emission Factors. The DEIR claims to have used the model EMFAC7, based on 40 mph and summer conditions to estimate vehicular emissions. (DEIR, Appx. C, Table 4-9.) However, the emission factors actually used are inconsistent with values estimated using the most recent version of this model, EMFAC7G. The emission factors estimated with EMFAC7G for summertime conditions are included in Exhibit 32. This exhibit demonstrates that emission factors depend on the fuel (gasoline, diesel) and pollution controls (catalyst or no 14-74 catalyst for gasoline engines). The DEIR, for example, assumes a "TOC"[67] emission rate of 0.38 g/mi for autos. The EMFAC7G output indicates that the "ROG" emission factor at 40 mph for light duty autos is 3.71 g/mi for light duty autos without catalysts and 0.16 g/mi for catalyst-equipped vehicles. Therefore, the DEIR apparently assumed that about 94% of the vehicles in the project area are catalyst equipped. The DEIR does not provide any justification or rationale for this and many other assumptions used to estimate the fuel and pollution controls for project traffic. This information should be included in the revised DEIR so reviewers can evaluate the assumptions and calculations.

The DEIR also does not appear to have included all of the sources of VOCs, NOx, CO and PM10 emissions. The DEIR appears to only have estimated "running" emissions, or those that occur during stable operating conditions. VOC, NOx, CO, and PM10 emissions are variously the sum of running, variable start, hot soak, diurnal, and resting emissions. PM10 emissions are additionally the sum of running, tire wear, break wear, and resuspended road dust. The DEIR does not explain how it derived its vehicle emissions factors from EMFAC, but it appears to have only included running emissions.

Truck Distribution. The DEIR estimated vehicular traffic emissions assuming that 100% of the commercial-light industrial zone vehicles, employee commute vehicles, and miscellaneous vehicles (DEIR, Appx. B, Table A-1) were light duty automobiles. (DEIR, Appx. C, Table 4-9.) This is not representative of local traffic patterns and is inconsistent with the noise analyses.

The truck noise analysis assumed that 100% of the commercial-light vehicles were trucks. Truck distribution data for local roadways shows that there is a large proportion of trucks in the area. The 1998 truck data indicates that at the junction of SR 89 and 299, 25% of the local traffic is trucks, of which 17% have 2 axles, 12% have 3 axles, 13% have 4 axles, and 58% have 5 or more axles. Similarly, along SR 89, 30% of the vehicles are trucks.[68]

Trip Length. The DEIR also underestimated vehicular emissions by assuming that the average trip length would be 30 miles per trip and the number of days on which traffic would occur would only be 120 days per year. (DEIR,

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[67] EMFAC7G reports organic compounds as reactive organic gases or "ROG," which is equivalent to "VOCs." The DEIR, on the other hand, reports organic compounds as total organic gases or "TOG." Generally, ROG is assumed to be about 95% to 98% of TOG. It is not clear why the DEIR reports organic emissions as TOG since reactive organic gases, by definition, are ozone precursors, and the regulatory thresholds are reported as ROG.

[68] California Department of Transportation (Caltrans), 1998 Annual Average Daily Truck Traffic on the California State Highway System.

Appx. C, Table 4-9, notes.) These assumptions result in significant underestimates of vehicular emissions.

First, raw material would likely be transported much larger distances than 30 miles roundtrip. As discussed in Comment III.A.2, the closest sources for asphalt are Klamath Falls, located about 140 miles from the site, and Elk Grove, located about 240 miles from the site. The project proposes to import sand from the Braden Sand Pit for the concrete plant. However, other local producers claim that the sand from this Pit is not suitable for making concrete or asphalt and indicate that the closest source of suitable sand is Shea in Redding, 67 miles from the project site. Finally, the project could supply construction materials over a very large area within the Intermountain area, constrained only by the price a purchaser is willing to pay. The relatively remote location of the site, with major population centers considerably further from the site than 30 miles roundtrip, suggests that a much larger travel distance is warranted.

Second, vehicular emissions assume the project operates only 120 days per year. As discussed in Comment I.A, the project components serving the construction industry would typically operate 180 days per year or more and could operate up to year round, depending on demand for product. For example, Three Mountain Power would be constructed year round until complete. Further, the u-haul, nursery, and truck repair facilities would operate year round.

The DEIR's vehicular traffic emissions should be revised to correctly reflect EMFAC7G emission factors, local vehicle distributions, trip length, and operating hours, and the analysis recirculated for public review.

V.B MITIGATION MEASURES ARE NOT ADEQUATE

V.B.1 Odor Impacts Not Properly Mitigated

The DEIR concluded that odor impacts from the asphalt plant would be "potentially significant and subject to mitigation" and recommended that odor counteractants be added to the stack flue gas to neutralize the odor if complaints were received. (DEIR, p. 4.3-14.) This is not adequate to mitigate odor impacts for two reasons. 14-75

First, the stack, which vents the dryer, is not usually the major source of odor at asphalt plants, although it can contribute under some circumstances. Based on my experience working with plant operators and communities that live downwind of asphalt plants, the major sources of odor complaints at asphalt plants are fugitive sources. The primary source of odor is typically the transfer of hot mix asphalt from the pug mill to trucks for shipment offsite, emissions from the bed of trucks at both the plant site and along the haul route, and fugitive emissions from tanks, pumps, flanges, and valves that are not properly maintained and/or controlled.

Odors from dumping hot mix asphalt into trucks are caused by the release of volatile organic compounds and sulfur gases trapped in the pore spaces of the asphalt-coated aggregate. See, for example, the photograph of a typical loading operation in Figure 5. These emissions have been studied by the EPA[69] and include many potent carcinogens, as well as odorous compounds. Therefore, these vapors should be controlled. (The DEIR did not include these vapors in its health risk assessment.)

Loading vapors can be controlled by enclosing the loading area and venting the gases through a blue smoke filter pack and the main stack baghouse. Truck bed emissions can be controlled by requiring that loads be tarped. Although the DEIR does require tarping of "dirt, sand, soil or other loose material" under some circumstances (DEIR, p. 4.3-13), it does not required the tarping of asphalt trucks. The DEIR suggests that there are no emissions from the asphalt oil storage tanks, arguing the system is a closed loop. (DEIR, Appx. C, p. 4.) However, these tanks are typically equipped with vents to allow the tanks to breath and prevent the accumulation of dangerous concentrations of flammable and explosive vapors. Asphalt odors from the hot asphalt and hot mix asphalt storage tanks are typically controlled using a condenser on the tank vents. Odors from fugitive sources, such as hatches, valves, flanges, and pipe connections, can be controlled by operating the pug mill under a slight negative pressure, conducting daily inspections, and performing maintenance as required. See, for example, the settlement agreement between an affected community and an asphalt plant in Exhibit 31.

Second, the proposed permit conditions require that action be taken only after an odor is experienced. Odors are intermittent and ephemeral. It is not uncommon for an odor to dissipate before it can be tracked to a source and mitigated. Therefore, the proposal to add chemical to the stack on detection will not effectively mitigate odors. Instead, the asphalt plant should be designed to minimize the opportunity for malodors. Odorous emissions from the pug mill stack and fugitive sources can be controlled by operating the mill under a slight vacuum, and venting the vapors to a baghouse and/or a scrubber (preferred). Plugging of vent lines is a common cause of odor from the mill, and vent lines must be inspected daily and maintained to assure they do not plug. (Exhibit 31.)

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[69] U.S. EPA, Hot Mix Asphalt Plants Truck Loading and Silo Filling Manual Methods Testing, Asphalt Plant C, Los Angeles, California, v. 1, Report EPA-454/R-00-025A, May 2000.

V.B.2 General Plan Mitigation Measures Not Required

The General Plan establishes Level "A" and "B" significance thresholds, which apply to vehicle emissions. When these levels are exceeded, the General Plan requires that mitigation measures be applied to reduce emissions. The Level "A" thresholds are 25 lb/day of NOx and VOCs and 80 lb/day of PM10. The Level "B" thresholds are 137 lb/day of NOx, VOCs, and PM10. (General Plan, Table AQ-4.)

The DEIR's estimate of vehicular emissions indicate that NOx emissions are 56 lb/day (DEIR, Appx. C, Table 4-9), which exceed the Level "A" threshold for NOx of 25 lb/day. The vehicular emissions for the DEIR's maximum case are 65 lb/day for each of PM10 and VOCs and 483 lb/day of NOx.[70] The VOC emissions exceed the Level"A" thresholds and the NOx emissions exceed the Level "B" threshold. The vehicular emissions for the operational design case (Table 1) exceed the Level "B" thresholds for NOx, ROG, and PM10 (Table 10).

14-76

The General Plan requires that applicable Standard Mitigation Measures ("SMM"), Best Available Mitigation Measures ("BAMM"), and "special" BAMM be imposed to reduce emissions below the Level "B" thresholds. If emissions cannot be reduced below Level "B" thresholds using SMM, BAMM, and special BAMM, emission offsets "will be required." (General Plan, p. 6.5.010.) Although the project's emissions exceed most of these thresholds, the DEIR does not recommend most of the mitigation measures recommended by Shasta County. (General Plan, p. 6.5.09 and Appx. C.)

The DEIR appended the County's list of SMM and BAMM at the end of Appendix C and required a few of these measures as mitigation, but did not mention "special" BAMM. (DEIR, pp. 4.3-10/14.) However, the measures selected from the County's list are mostly methods to reduce fugitive dusts, rather than NOx or VOCs. These measures are already assumed in the DEIR's calculation of PM10 emissions, which assume substantial control, at the upper limit of what is achievable. (DEIR, Appx. C, Tables 4-4, 4-5, 4-6.) The DEIR's emission calculations demonstrate that the emissions are significant, even with control. Therefore, the proposed methods do not reduce PM10. The proposed

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[70] Vehicular emissions of VOCs for DEIR maximum case = [(6.3 lb/day)(432 truck trips/day)/43 truck trips/day) + (3.19 lb/day)(189 auto trips/day)/127 auto trips/day)]0.95 = 64.6 lb/day. The number of truck trips and auto trips for the average and maximum cases are from DEIR, Appx. B, Table A-1 and the average VOC emissions for trucks and autos are from DEIR, Appx. C, Table 4-9. The calculations assumes that 95% of the TOC (reported in the DEIR) is reactive organic gases ("VOCs" or "ROG").

mitigation measures in the DEIR also do not reduce NOx or VOCs emissions from traffic.

There are many additional SMMs and BAMMs on the County's list of mitigation measures that are applicable and should be required. These include:

- Paved streets adjacent to the development site should be swept or washed at the end of each day to remove excessive accumulations of silt and/or mud which may have accumulated as a result of activities on the development site.
- Adjacent paved streets shall be swept at the end of each day if substantial volumes of soil materials have been carried onto adjacent public paved roads from the project site.
- Wheel washers shall be installed where project vehicles and/or equipment enter and/or exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed prior to each trip.
- Prior to final occupancy, the applicant shall reestablish ground cover on the construction site through seeding and watering in accordance with the Shasta County Grading Ordinance.
- The project shall provide for temporary traffic control as appropriate during all phases of construction to improve traffic flow as deemed appropriate by the Department of Public Works and/or Caltrans.
- The project shall include provisions for the use of fleet vehicles that use clean-burning fuels as may be practicable.
- The project shall include the installation of solar water heaters for at least 25% of the building floor area.
- The project shall improve the thermal efficiency of commercial and industrial structures as appropriate by: (1) reducing thermal load with automated and timed temperature controls, or (2) occupancy load limits.
- The project shall incorporate shade trees, adequate in number and proportional to the project size, throughout the project site to reduce building heating and cooling requirements.

The minerals processing operations proposed at this site are well known to create significant soiling problems on adjoining streets. The first three measures are commonly required for similar operations (Exhibit 31) and are essential to mitigate this impact.

The DEIR requires a measure similar to the first-listed measure above. However, it only requires that paved public roadways adjacent to the project site be swept "if substantial volumes of soil materials have been carried onto them." (DEIR, p. 4.3-11, MM4.3.1f.) This measure should be automatically required *daily* when *any* of the quarry, rock crushing and screening plant, cement plant, or asphalt plant are operating because these operations routinely deposit large amounts of dirt on adjacent roadways.

The DEIR requires that clearing, grading, earth moving or excavation activities be halted during winds that exceed 20 mph. (DEIR, p. 4.3-11, MM 4.3.1d.) This measure is not adequate for two reasons. First, it provides no enforcement mechanism. The measure should be expanded to require that it be enforced by using an on-site meteorological station that automatically transmits wind data to the County to assure proper enforcement. Second, it excludes blasting, which should be curtained during high winds to eliminate wind-blown dusts.

Finally, there are a few additional mitigation measures, which are commonly required at mining sites and are necessary here to meet the control efficiencies assumed in the PM10 emission calculations.[71] These are:

- Haul roads within the site boundary shall be surfaced with durable gravel and shall be well maintained.
- Water or surface binding agents shall be applied to haul and access roads within the site boundary as needed.
- Speeds shall be 35 mph or less on all unpaved on-site roads and the restriction shall be enforced to minimize surface disturbance of the roadways.
- During all drilling operations, air drilling equipment shall be shrouded with standard debris collection devices and/or wet drilling techniques shall be used. Manufacturer specifications for all shrouding devices shall be submitted to the SCAQMD for review before use. The debris collecting devices shall have a minimum design efficiency of 90%.
- The primary, secondary, and tertiary crushers, screens, and all transfer points shall be completely enclosed or shrouded to minimize exposure to wind and, at a minimum, shall use spray bars to control fugitive dust emissions. Conveyors shall be enclosed in selected areas where the moisture content and/or consistency of the material would allow generation of wind-blown dust.

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[71] See, for example, Bureau of Land Management and County of San Bernardino, Castle Mountain Mine Expansion Project, San Bernardino County, California, Draft Environmental Impact Statement/Environmental Impact Report, March 1997, pp. 3.6-17/18.

- Dust suppression for secondary/tertiary crushing operations shall be controlled using baghouses constructed to specifications acceptable to the SCAQMD.
- The live storage portion of the aggregate stockpiles shall be covered to minimize wind-blown dust.

In sum, the DEIR does not contain an analysis to determine whether the project complies with County significance thresholds. Even though significance thresholds are exceeded, the DEIR does not impose all feasible SMM and BAMM and is wholly silent on "special BAMM." The DEIR should be revised to explicitly evaluate the ability of the project and proposed mitigation measures to comply with Level "A" and "B" thresholds.

VI. NOISE

The site is located in a predominately rural area, 0.75 miles south of McArthur Burney Falls Memorial State Park and about 3 miles south of Lake Britton. Permanent residences and a trailer park that rents to Park visitors are located immediately across the street from the project site. The types of facilities proposed for this site are well known to create noise problems in surrounding communities. Noise is a major concern because of its potential impact on permanent residents and Park visitors, including overnight campers.

The DEIR inappropriately suggests that noise is not a concern because the site was formerly home to a lumber mill with a history of industrial noise and heavy truck trip generation. (DEIR, p. 4.8-6.) As discussed in Comment II.B.2, this is inconsistent with CEQA, which requires that a project be evaluated relative to the existing baseline, not a baseline that occurred over a decade ago.

We also note that the County's noise performance standards are expressed in terms of both Ldn and CNEL. The DEIR's analysis focuses on Ldn, as do my comments. However, noise levels expressed as CNEL would be higher than as Ldn, because the CNEL includes the addition of 5 dB to sound levels in the evening hours from 7:00 PM to 10:00 PM, as well as the usual addition of 10 dB during he nighttime hours, to account for increased sensitivity of people to intrusive noise during these hours. The DEIR did not evaluate CNEL and inexplicably assumed that truck trips would not increase during the evening hours, even though the project could operate until 8:00 PM. 14-77

The DEIR has underestimated the noise impacts of the project. As demonstrated below, noise levels from the processing equipment and increased traffic both exceed significance thresholds in the Noise Element of the County

General Plan. These are new significant impacts that were not discussed in the DEIR and which must be mitigated.

It is important to realize that the analyses presented here and in the DEIR do not reveal the full impact of the project on the public. Noise is a nuisance, detracting from the quality of life. It also disturbs sleep, causes mood swings including depression and irritability, depresses the immune system, may increase blood pressure, and may be harmful to the growth and development of the brains of babies. (Carter 1996.[72])

There is a large body of research which indicates that the metrics normally used in noise analyses and ordinances do not capture the full range of impacts. These studies have generally concluded that intermittent noise, such as is common from the operations proposed here is more disturbing than continuous noise. Metrics that characterize noise as groups of events over an entire night or 24-hr period, such as the L_{eq}, L_{dn}, and CNEL, are almost universally used in noise analyses and ordinances. These metrics average out the peaks that cause sleep disturbance and other health effects and do not appear to correlate with sleep disturbance. Reactions to noise are correlated with the emergence of the noise event and the number of events exceeding 50-55 L_{Amax} in the bedroom, which has not been analyzed.

VI.A PROCESSING EQUIPMENT NOISE IS SIGNIFICANT

The DEIR concludes that the noise impacts of individual processing facilities are not significant, but that the cumulative impacts of all facilities combined are "potentially significant and subject to mitigation." (DEIR, p. 4.8-18.) The DEIR's analysis has significantly underestimated noise and failed to impose adequate mitigation. 14-78

Sound propagating outdoors through the atmosphere generally decreases in level with increasing distance between source and receiver. This attenuation results from several factors, principally geometrical divergence or spreading from the sound source and absorption of acoustic energy by the air. The word "attenuation" is used to describe any reduction in sound pressure level at distance from the source.

[72] Norman L. Carter, Transportation Noise, Sleep, and Possible After-Effects, Environment International, v. 22, no. 1, 1996, pp. 105-116. (Appendix E-4.)

The DEIR considered these two principal attenuations in Table 4.8-5. The DEIR estimated "distance" attenuation[73] as a reduction of 6 dB for each doubling distance. It also estimated "atmospheric" and other attenuation[74] as 1.5 dB per 1000 feet. (DEIR, Table 4.8-5, note 4.) The latter estimate is quite large for atmospheric attenuation and is characteristic of very low relative humidities, which do not commonly occur in the area[75] and high frequency sounds, which are not typical of the noise sources at the project. The DEIR should justify this choice.

The noise levels due to the project were calculated by subtracting these two attenuation terms from the equipment noise measured at 100 feet in Table 4.8-4. However, some attenuation mechanisms result in sound pressure levels that are *greater* than would be expected from distance and air absorption attenuation. These include reflection from the rock ledge and refraction due to vertical gradients of wind and temperature. These effects would *increase* the project noise levels compared to those reported in Table 4.8-5.

The processing equipment would be located near the base of a 70 to 80 foot high wall of basalt. The basalt wall would be highly reflective, and most of the sound would likely be reflected back away from the site towards off-site receptors, rather than being propagated spherically around the point source. This could double the sound level reaching receptors, increasing noise levels by up to about 3 dB.

Atmospheric and meteorological conditions can have a profound effect on noise levels. The DEIR considered attenuation from air absorption, which reduces sound levels. However, vertical velocity and temperature gradients can bend sound waves downward, increasing sound levels. Air temperatures usually decrease with increasing height above the ground. Under stable atmospheric conditions, however, temperature profiles are inverted, or temperature increases with height. This is referred to as an "inversion" and causes the speeds of sound to increase with altitude, causing noise refraction.

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[73] "Distance" refers to geometric spreading from a point source. This causes the sound level to drop off at a rate of 6 dB for each doubling distance and is often referred to as the "inverse square law." It is calculated from $dBA_2 = dBA_1 + 20 \text{ Log}_{10}(d_1/d_2)$ where dBA_1 is the equipment noise level measured at 100 feet and reported in Table 4.8-4, d_1 is 100 feet, and d_2 is the distance between the source and the receptor.

[74] As sound propagates through the atmosphere, its energy is gradually converted into heat, i.e., the sound is absorbed, by a number of molecular processes in the air called "air absorption." This is referred to as "atmospheric" in the DEIR. Air absorption depends strongly on frequency and relative humidity. The DEIR assumed an attenuation rate of 1.5 dB per 1,000 feet for atmospheric and other excess anomalous attenuation.

[75] U.S. Weather Bureau, Climate of Shasta County, August 1965.

Under these conditions, noise may be carried over long distances in a channelized fashion, reducing the usual attenuation rates. Inversions are frequent in the Burney Basin (Comment IV.A.3.c) and should have been considered in the noise analysis.

This phenomena has been studied[76] and can increase noise levels up to about 20 dB.[77] The highest increases occur for low frequency sounds, which are characteristic of the proposed processing equipment. Meteorological attenuation curves are included in Exhibit 33 and indicate that at 4,000 to 5,500 feet from the noise generating equipment (DEIR, Table 4.8-5), the increase in sound levels would typically be about 10 dB for typical inversion conditions.

Therefore, the Lmax and Leq values reported in the DEIR in Table 4.8-5 would be about 13 dB higher at the nearest residence than reported, 3 dB for reflection and 10 dB for inversions. This would increase the Leq to 50 dB during the Phase I excavation; 52 dB during the Phase II excavation; 55 dB during the Phase III excavation; 51 dB from the crushing and screening plant; 52 dB from the asphalt plant; 53 dB from the concrete plant, and 46 dB from the truck repair facility.

The General Plan prohibits new development where the noise level due to non-transportation sources exceeds an Leq of 55 dB during the daytime (7AM to 10 PM) or an Leq of 50 dB during the nighttime (10 PM to 7 AM). (General Plan, Table N-1, p. 5.5.11, Policy N-a.) Processing operations would commence at 4 AM. (DEIR, pp. 3-12/14.) Therefore, the sound levels from Phases I and II of the quarry and from the crushing and screening plant, asphalt plant, and concrete plant would violate the General Plan noise standards during early morning hours, when most receptors would be sleeping. The General Plan requires that noise in excess of these limits be mitigated.

The combined Leq from all of this equipment is 60 dB, which exceeds both the daytime and nighttime Leq performance standard for new projects. The existing Leq at the nearest residence is 52 dB. (DEIR, Table 4.8-1.) Therefore, on-site processing would increase the noise level at the nearest residence by 9 dB. This corresponds to nearly doubling (87%) the perceived sound (i.e., the sound

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[76] P.H. Parkin and W.E. Scholes, The Horizontal Propagation of Sound from a Jet Engine Close to the Ground, at Radlett, Journal of Sound and Vibration, v. I, 1964, pp. 1-13; P.H. Parkin and W.E. Scholes, The Horizontal Propagation of Sound from a Jet Engine Close to the Ground, at Radlett, Journal of Sound and Vibration, v. 2, no. 4, pp. 353-374; C.J. Manning, The Propagation of Noise from Petrochemical and Petrochemical Complexes to Neighbouring Communities, CONCAWE Report No. 4/81, May 1981.

[77] Cyril M. Harris, Handbook of Acoustical Measurements and Noise Control, 3rd Ed., McGraw-Hill, Inc., New York, 1991, p.p. 3.10 to 3.12.

will be perceived as nearly twice as loud) during the very sensitive early morning hours when most people are still asleep. The cumulative increase from the processing equipment (60 dB) and predicted traffic noise level (58.9 dB) would be 62 dB, or double current noise levels. This is a highly significant impact that was not discussed in the DEIR.

The DEIR hinted that combined noise levels could be "potentially significant and subject to mitigation," even though the combined noise level of 46 dB is less than the County performance standard of 50 dB and imposes two inadequate mitigation measures. (DEIR, p. 4.8-18.) The first requires that noise measurements be made after the project is constructed to identify potentially significant impacts and mitigated as appropriate (MM 4.8.9a). The second simply reminds the County of its duty to enforce the existing Noise Element of the General Plan (MM4.8.9b).

This violates CEQA, which does not allow post-project impact analysis and mitigation. This not only precludes meaningful public review, it also subjects affected parties to significant impacts until they are mitigated. This also does not assure that the impacts, even if they occur, would actually be mitigated without protracted public protest. This significant impact must be quantified and mitigated in the DEIR itself. The DEIR should be revised to require that noise levels be specified for all project equipment that assure noise standards are met under worst-case conditions at the property line of the nearest residence. Under no circumstance should the permissible equipment noise levels be greater than used in the noise analysis. In addition, the facilities should be designed and operated to comply with the following:

- Exhaust from all pneumatic valves on the asphalt plant should be silenced.
- Aggregate bin vibrators should be insulated.
- The use of buzzers, bells, and horns should be prohibited.
- Silencers should be installed on the dryer burner air intake fan, low-pressure burner inlet damper, the baghouse exhaust fan, and the baghouse outlet stack of the asphalt plant.
- Sound walls should be installed around all pumps (e.g., oil heater) and all generators and air compressors.

VI.B TRAFFIC NOISE IS SIGNIFICANT

The DEIR used the Federal Highway Administration ("FHWA") Highway Traffic Noise Prediction Model (FHWA RD-77-108) to predict the increase in 14-79 noise levels that would occur at 200 feet from the centerline of SR 89. (DEIR, pp. 4.8-12/13.) The DEIR's analysis has three major flaws: (1) it fails to conclude impacts are significant when its own analysis shows they are; (2) it fails to analyze the road segments with the highest current noise levels; and (3) it fails to evaluate design traffic volumes. Each of these issues is discussed below.

VI.B.1 The DEIR's Analysis Indicates Traffic Noise Impacts Are Significant

The DEIR does not report post-project noise levels, instead reporting the no-project level, 58.3 dB, and project increases, 0.6 dB for the average case and 2.9 dB for the maximum case. (DEIR, Table 4.8-6.) The corresponding post-project noise levels are 58.9 dB for the average case and 61.2 dB for the maximum case. 14-80

The County's Noise Element requires that transportation noise sources not increase outdoor noise levels at the property line of residents and transient lodging above 60 dB Ldn. (General Plan, Table N-3.) Therefore, the results of the DEIR's noise analysis for the maximum project case shows that project noise levels exceed the County performance standard of 60 dB. Although the maximum post-project noise level estimated in the DEIR violates the County's General Plan and therefore must be mitigated, the DEIR never states this important fact. Instead, the DEIR argues that its analysis is conservative, never once hinting that its own analysis exceeds the County's performance standard. The DEIR should have found a significant traffic noise impact and recommended mitigation. 14-81

Instead, the DEIR argues that its analysis is conservative because it assumed that all project traffic would arrive and depart from the north, thereby passing in close proximity to the nearest existing residence. However, in the absence of any information to the contrary, any other assumption would be speculative. Further, the nearest residences are relatively close to the site, and even though 100% of the trucks may not pass directly in front of their homes, noise radiates uniformly outward in a spherical pattern, which would allow some of the noise to reach these residences. This is accounted for in the FHWA model by adjusting the reference noise levels to account for only that energy coming from a portion of the roadway by specifying the angle between the source and receptor, i.e., the finite roadway adjustment. 14-82

I do not know whether the DEIR made this adjustment because the County refused to respond to my questions on this and other aspects of the traffic noise analysis. I was not able to duplicate the DEIR's traffic noise results without assuming a finite roadway adjustment. Therefore, the DEIR should have concluded, based on its own analysis, that traffic noise impacts would be significant. 14-83

The position the DEIR has taken on traffic noise is inconsistent with the position the DEIR takes on processing equipment noise. In the latter case, the DEIR concluded that cumulative noise impacts were "potentially significant and subject to mitigation," even though the cumulative noise level, 46 dB, was less than the County's standard of 50 dB. Here, even though the DEIR's estimate of 61 dB is greater than the County's standard of 60 dB, the DEIR fails to find a significant impact. 14-84

VI.B.2 The DEIR Did Not Evaluate Its Own Worst Case

Noise increases as the traffic volume increases. The larger the background level, the more significant increases due to the project. The DEIR evaluated the impact of project traffic on noise levels along SR 89 at its junction with SR 299. The average daily traffic is 2,250 on SR 89 at this junction. However, the ADT is 4,500 on SR 299 at this same junction and has comparable truck volumes. Therefore, existing noise levels would be higher than along the segment evaluated by the DEIR. 14-85

I repeated the DEIR's analysis, using the same methods, assumptions, and data sources for SR 299 at its junction with 89. As discussed in Comment IV.A.3.a and shown on Figure 3, 63% of the project's traffic would travel west through this junction. Further, there are residences west of this junction, in Johnson Park and Burney, that are closer to the roadway than the 200 feet assumed in the DEIR's analysis. 14-86

This analysis indicates that the no-project Ldn is 60.0 dB, the average project Ldn is 46.6 dB, and the maximum project Ldn is 55.0 dB. The corresponding post-project combined Ldn would be 60.2 dB for average conditions and 61.2 dB for maximum conditions. These both exceed the County's noise performance standard of 60 dB for residential properties affected by transportation noise. This is a significant impact that was not discussed in the DEIR. The County's Noise element requires that noise levels be mitigated to less than 60 dB. 14-87

VI.B.3 The DEIR Did Not Evaluate Design Case

The DEIR evaluated the increase in traffic noise along SR 89 due to the traffic volumes estimated in Appendix B, Table A-1. However, as discussed in Comment III.A, the DEIR underestimated traffic volumes. The revised traffic volumes are summarized in Table 5. 14-88

I repeated the DEIR's analysis for each revised case shown in Table 5, using the same methods and assumptions as used in the DEIR. These calculations indicate that the post-project Ldn for the revised DEIR average case is 60.6 dB; for the revised DEIR maximum case, the post-project Ldn is 65.0 dB; and for the design case, the post-project Ldn is 67.8 dB. All of these noise levels exceed the County's performance standard of 60 dB Ldn. This is a significant impact of the project that was not discussed in the DEIR. 14-89

Letter 14 J. Phyllis Fox, Ph.D., Environmental Management

General Response to Entire Comment Letter

A majority of comments found in this letter are premised on assumptions developed by the commentor. The commentor, in many instances, disregards the specific maximum production levels provided by the Project Proponent in their Reclamation Plan, and detailed in the DEIR Project Description, and instead creates inflated production levels, and subsequent environmental impacts, based on the maximum production capacity of plant equipment slated for operation. The rationale is simply that if plant equipment <u>can</u> operate at higher levels than those proposed, then it <u>will</u> be operated at those higher levels. This assumption is incorrect. In general, plant equipment has high hourly output rates because large jobs require high output over a short period of time. Following high output, the plant may lay idle for two weeks or more. This is the nature of the construction business. The DEIR Project Description, as well as the Reclamation Plan submitted to the California Department of Conservation/Office of Mine Reclamation, stipulates the following project production levels which were analyzed in the DEIR:

Material	Average	Maximum
Quarry (yd^3/yr)	30,000	45,000
Crushing and Screening (yd^3/yr)	30,000	45,000
Concrete Batch Plant (yd^3/yr)	8,000	25,000
Asphalt Plant (yd^3/yr)	10,000	100,000

Confusion created by the commentor's assumptions is compounded throughout the comment letter, as the commentor utilizes incorrect extraction and production levels to analyze for impacts to hydrology and water quality, traffic, public health, air quality, and noise.

Material extraction restrictions, manufacturing production levels, and groundwater consumption limits provided in the DEIR and the Reclamation Plan will become enforceable permit conditions in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department. In other words, the Project Proponent will be unable to extract mineral or manufacture aggregate, concrete, or asphalt at levels beyond those analyzed in the DEIR. Moreover, any subsequent proposed changes to extraction or production levels for the Eastside Aggregates Project beyond those stipulated in the Reclamation Plan and analyzed in the DEIR would require an amendment to the Conditional Use Permit, which in turn would require CEQA compliance, including environmental review and analysis. The additional environmental analysis associated with a Conditional Use Permit amendment could result in the addition of applicable mitigation measures if potentially significant impacts were identified.

Where the commentor raises questions concerning potential impacts related to the DEIR's "defined" project description, clarification, additional information, or amendments to the DEIR are provided.

Response to Comment 14-1

Comment noted. Please see General Response to Entire Comment Letter 14.

Response to Comment 14-2

Comment noted. Please see General Response to Entire Comment Letter 14.

Response to Comment 14-3

Comment noted. Please see General Response to Entire Comment Letter 14.

Response to Comment 14-4

Comment noted. Please see General Response to Entire Comment Letter 14 and Response to Comment 13-3. In addition, the SCAQMD request for "[a]nalyses of the maximum daily and annual emission rates that are *projected* for the construction and operation phases of the proposed project" (emphasis added) was precisely what the DEIR accomplished. The "projected" maximum daily and annual emission rates were based on the annual average and maximum production levels specified in the DEIR Project Description. Based on this scenario and additional air quality analysis, no further impacts were identified. Also, see Response to Comment 14-63.

Response to Comment 14-5

Comment noted. Page 3-11 of the DEIR is modified to read as follows:

> The height of the bluff is approximately ***70*** feet.

Both the DEIR and the Reclamation Plan conclude that the project proponent will extract an average annual amount of 30,000 cubic yards of usable material, with a maximum annual amount not to exceed 45,000 cubic yards (DEIR, p. 3-11; Reclamation Plan, p. 24). In addition, the project proponent, over the thirty-year life of the project, agrees to not extract more than 900,000 cubic yards of usable material from the quarry. These specific extraction amounts will become enforceable permit conditions of the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-6

Comment noted. Please see General Response to Entire Comment Letter 14. The information submitted to the SCAQMD does not suggest that a larger operation is contemplated. Material submitted to SCAQMD related to project equipment specifications (i.e., maximum production capacity) does not infer equipment usage at maximum or average levels as suggested by the commentor. Crushing and screening production levels provided in the DEIR and the Reclamation Plan cite specific production amounts (30,000 yd^3/yr - Average, 45,000 yd^3/yr - Maximum) that will become enforceable permit conditions in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-7

Comment noted. Please see General Response to Entire Comment Letter 14 and Response to Comment 13-3.

Response to Comment 14-8

Water use of the concrete batch plant is included in the DEIR. Please refer to Page 4.7-14/15 of the DEIR where it states - "it is estimated that approximately 900,000 gallons of water per year would be used by the operation for washing, or approximately 2.76 acre-feet per year. Assuming that the quarry, the *concrete plant*, the asphalt plant and the repair shop used the same amount of water as the crushing and screening operation, the total amount of water that would be consumed by the project per year would be approximately 13.8 acre-feet" (emphasis added). As can be seen from this statement, water use for the concrete plant is estimated at 2.76 acre-feet or 900,000 gallons per year.

Response to Comment 14-9

Comment noted. Please see Response to Entire Comment Letter 14. The information submitted to the SCAQMD does not suggest that a larger operation is contemplated. Material submitted to SCAQMD related to project equipment specifications (i.e., maximum production capacity) does not infer equipment usage at maximum or average levels as suggested by the commentor. Concrete batch plant production levels provided in the DEIR and the Reclamation Plan cite specific outputs that will become enforceable permit conditions in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-10

Comment noted. Please see General Response to Entire Comment Letter 14 and Response to Comment 13-3.

Response to Comment 14-11

Comment noted. Please see Response to Comment 13-3.

Response to Comment 14-12

Comment noted. Please see General Response to Entire Comment Letter 14, Response to Comment 14-13, and Response to Comment 13-3.

Response to Comment 14-13

Comment noted. Please see General Response to Entire Comment Letter 14. While admittedly the project proponent acknowledges that "the exact specifications for the plant will closely resemble Northstate Asphalt's pug mill plant on Clear Creek Road in Redding" as documented by the commentor, the project proponent does not state that they will operate the facility in the same manner. The DEIR Project Description, as well as the Reclamation Plan submitted to the Shasta County Planning Department and the California Department of Conservation/Office of Mine Reclamation, stipulates project production levels for the asphalt plant of 10,000 yd^3/yr on average and 100,000 yd³/yr maximum. Manufacturing production limits provided in the DEIR and the Reclamation Plan will become enforceable permit conditions in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-14

Comment noted. Page 4.7-11 of the DEIR is modified to read as follows:

> Several components of the projects would require the use of water, which would be provided by existing wells on the project site. The most significant water user would be the crushing and screening operation, which would use water to wash processed material. As stated in Section 3.0, Project Description, the operation ***of the crushing and screening facility*** would use approximately 900,000 gallons of water per year on average. ***For impact analysis purposes, it is assumed that the quarry, the concrete plant, the asphalt plant, and the repair shop will use the same amount of water as the crushing and screening operation. Therefore, the maximum amount of water that would be consumed by the project per year would be approximately 4.5 million gallons (this is described in more detail in Impact 4.7.6, pg. 4.7-13/15). This amount includes water*** ~~Water would also be~~ required for dust control activities at the plant sites and on unpaved portions of the site.

The figure of 1,800,000 gallons of water for cumulative analysis is not found in the DEIR as cited by the commentor on pages 4.7-14/15 of the DEIR. In fact, pages 4.7-14/15 states that for the sake of impact analysis it is assumed that 13.8 acre-feet of water would be consumed annually. For clarification of measurement, the DEIR, on page 4.7-15, is modified to read as follows:

> . . . the total amount of water that would be consumed by the project per year would be approximately 13.8 acre-feet***, or 4.5 million gallons.***

The assumption that 900,000 gallons of water would be utilized for the crushing and screening operation comes from a conservative estimate provided by the Project Proponent. This number was used for other phases of the proposed project to insure that the final number, 4.5 million gallons or 13.8 acre-feet, adequately covered maximum annual water consumption. Realistically, the other activities associated with the project would consume less water than the crushing and screening operation.

Response to Comment 14-15

Comment noted. Water necessary for dust control activities is built into the proposed project's overestimated annual water consumption amount of 4.5 million gallons. In addition, it is important to note that water spraying for dust abatement on unpaved areas will be performed only on days when trucks and loaders are active. Spraying will not occur on days when trucks or loaders are not active. However, to add specificity to the mitigation measure regarding water spraying for dust control, the DEIR, on page 4.3-13, is modified to read as follows:

MM 4.3.3a ***On days when trucks and loaders are active,*** ~~A~~***a***ll areas with vehicle traffic, including unpaved roadways, shall be watered ~~periodically or~~ ***in the following manner:***

- ***Normal days (winds below 25 mph) - Spray with water truck 2 times daily, once in the morning and again in the early afternoon.***
- ***Windy days (winds above 25 mph) - Spray with water truck 6 times daily, once in the morning and then 5 additional times in equal increments throughout the work day.***

In addition, unpaved roadways shall have dust palliatives applied for stabilization of dust emissions.

Response to Comment 14-16

Comment noted. Please see General Response to Entire Comment Letter 14.

Response to Comment 14-17

Comment noted. Please see General Response to Entire Comment Letter 14. Water use for dust control at the rock quarry is included in the 900,000 gallons estimated for annual use for the quarry operation (DEIR, p. 4.7-14/15).

Response to Comment 14-18

Comment noted. Please see General Response to Entire Comment Letter 14. While 900,000 gallons was estimated annually for use at the quarry operation, the entire project was assessed for the impact of consuming 4.5 million gallons of water annually. This annual groundwater consumption limit as analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-19

Comment noted. Please see General Response to Entire Comment Letter 14. The Reclamation Plan does not indicate that 3.0 million cubic yards of rock would be quarried over the 30-year life of the quarry's operation, it indicates that 900,000 cubic yards of material will be mined over a 30-year period (Reclamation Plan, p. 6).

Response to Comment 14-20

Comment noted. Please see General Response to Entire Comment Letter 14. Water use for dust control at the wash plant is included in the 900,000 gallons estimated for annual use for the crushing and screening operation (DEIR, p. 4.7-14/15).

Response to Comment 14-21

Comment noted. Please see General Response to Entire Comment Letter 14. While 900,000 gallons was estimated annually for use at the crushing and screening operation, the entire project was assessed for the impact of consuming 4.5 million gallons of water annually. This annual groundwater consumption limit as analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-22

Comment noted. Please see General Response to Entire Comment Letter 14. In addition to creating false assumptions for determining water use, the comment does not take into consideration that aggregate slated for the asphalt plant will not be washed because the fines are beneficial to the process.

Response to Comment 14-23

The applicant's assumptions regarding the wash plant's processing rate and water use are correct, while the commentor's assumption that the plant would operate continuously throughout the construction season is incorrect. It is important to note that the construction business is highly speculative. For example, a large job may have the project running for two weeks straight, and then the plant may sit idle for two weeks. Unlike a predictable production operation where *x* number of widgets are produced over *y* number of months year after year, you cannot make these same simple calculations of aggregate production or water consumption based on the plant's equipment and the number of working days in a construction season.

While 900,000 gallons was estimated annually for use at the crushing and screening operation, the entire project was assessed for the impact of consuming 4.5 million gallons of water annually. This annual groundwater consumption limit as analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-24

Comment noted. Please see General Response to Entire Comment Letter 14. Because there will be limitations on both the production of aggregate and consumption of groundwater specified in the Eastside Aggregates Conditional Use Permit, the speculative calculations derived by the commentor in this comment are not pertinent to this analysis.

Response to Comment 14-25

Comment noted. Please see General Response to Entire Comment Letter 14. Water use for dust control is included in the 900,000 gallons estimated for annual use for the crushing and screening operation (DEIR, p. 4.7-14/15). While 900,000 gallons was estimated annually for use at the crushing and screening operation, the entire project was assessed for the impact of consuming 4.5 million gallons of water annually. This annual groundwater consumption limit as analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-26

Comment noted. Please see General Response to Entire Comment Letter 14. Because there will be limitations on both the production of aggregate and consumption of groundwater specified in the Eastside Aggregates Conditional Use Permit, the speculative calculations derived by the commentor in this comment are not pertinent to this analysis.

Response to Comment 14-27

Comment noted. Please see General Response to Entire Comment Letter 14 and Response to Comment 14-8. Although we do not agree with the commentor's figures for analysis, the necessary range of water use estimated by the commentor for hydrating cement, controlling dust, and as wash water (296,000 to 925,000 gallons) at the concrete plant producing between 8,000 and 25,000 cubic yards of concrete per year is very close to the 900,000 gallon limit identified and analyzed for impacts by the DEIR for the concrete plant.

Response to Comment 14-28

Comment noted. Please see General Response to Entire Comment Letter 14. Although we do not agree with the commentor's figures for analysis, the range of water use estimated by the commentor for dust abatement (54,800 to 547,600 gallons) at the asphalt plant producing between 10,000 and 100,000 cubic yards of asphalt per year is significantly less than the 900,000 gallon limit identified and analyzed for impacts by the DEIR for the asphalt plant.

Response to Comment 14-29

Comment noted. Please see Response to Comment 14-15. Water spraying for dust abatement on unpaved areas will be performed on roads and work areas where trucks or loaders operate and on days when trucks and loaders are active. Spraying will not occur on days when trucks or loaders are not active. As discussed on page 4.3-13 of the DEIR in Mitigation Measure 4.3.3a, specific water spraying will be required for normal and windy days, in addition to the application of dust palliatives to control dust emissions. In fact, all on-site roads and work areas currently have an aggregate surfacing (cinder) applied which minimizes dust emissions.

Response to Comment 14-30

Comment noted. Incidental uses will consist mainly of bathroom use and drinking water. In addition, the night watchman lives alone on-site. Regardless of these minor consumptive water uses, any small incidental uses are adequately contained in the annual 4.5 million gallon groundwater use assessed for potential impacts in the DEIR. This annual groundwater consumption limit as analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-31

Comment noted. Please see General Response to Entire Comment Letter 14. Because there will be limitations on both the production of aggregate and consumption of groundwater specified in the

Eastside Aggregates Conditional Use Permit, the speculative calculations derived by the commentor in this comment are not pertinent to this analysis.

This entire comment is premised on false assumptions developed by the commentor. The commentor disregards the specific annual groundwater consumption levels provided in the DEIR, 4.5 million gallons, and instead creates false groundwater consumption levels, and subsequent environmental impacts, based on the maximum production capacity of plant equipment. Again, the rationale appears to be that if the project applicant physically can pump larger amounts of groundwater than those proposed and analyzed in the DEIR, then they will. This assumption is incorrect.

Confusion created by the commentor's false assumptions is compounded for many pages, as the commentor utilizes her own incorrect groundwater consumption level, 133 million gallons (Table 3, Fox Comment Letter), *or over 29 times more than the 4.5 million gallons analyzed in the DEIR*, to analyze for impacts to natural springs and federally- and state-listed endangered Shasta crayfish.

The annual 4.5 million gallon groundwater consumption level described and analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department. In other words, the project applicant will be unable to consume groundwater at levels beyond those analyzed in the DEIR. Moreover, any subsequent proposed changes to groundwater extraction levels for the Eastside Aggregates Project beyond those analyzed in the DEIR would require an amendment to the Conditional Use Permit, which in turn would require CEQA compliance, including environmental review and analysis. The additional environmental analysis associated with a Conditional Use Permit amendment could result in the addition of applicable mitigation measures if potentially significant impacts were identified.

Response to Comment 14-32

Comment noted. Please see General Response to Entire Comment Letter 14. The entire project was assessed for the impact of consuming 4.5 million gallons of water annually. This annual groundwater consumption limit as analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-33

Comment noted. Please see Response to Comment 5-14, as page 4.7-11 of the DEIR has been modified to consistently reflect that 4.5 million gallons of groundwater will be consumed annually as part of the proposed project. The annual 13.8 acre-feet (or 4.5 million gallon) groundwater consumption level is analyzed for impact in the cumulative impacts analysis section of the hydrology chapter of the DEIR (DEIR, p. 4.7-13/15).

Wash water from the crushing and screening operation, in particular, is to be conveyed via pipeline to the retention basin. For clarification regarding the commentor's concern, the DEIR, on page 4.7-11, is modified to read as follows:

Wash water *from the crushing and screening operation* would be conveyed via pipeline to the retention basins.

The geohydrologic study relied on in preparation of the DEIR, and referenced by the commentor states the project site "is underlain by a highly permeable aquifer consisting of fractured porous basaltic lava flow rocks. At the surface, the basalt is covered by a thin, *less* permeable reddish-brown silt loam. This loam is generally above the water table, but may *limit* the quantity of vertical recharge" (emphasis added) (Carlson 11/4/86, p. 1). Later in the report, the author states, "[a]bove the basalt lies a thin (*zero*- to 10-foot) surface layer of reddish-brown silty loam" (emphasis added) (Carlson 11/4/86, p. 6). And again, as noted by the commentor, Carlson concludes "[w]ater levels taken at the monitoring and production wells did not show the development of a significant groundwater mound beneath the mill pond. This indicates that a *low permeable* layer has developed on the bottom of the pond and therefore vertical seepage from the pond is *much less* than the ability of the basalt aquifer to move the groundwater away" (emphasis added) (Carlson 11/4/86, pp. 6-7). The commentor suggests that Carlson's report concludes that the silty loam layer beneath the pond is "an *impermeable* confining layer [that] would *prevent* infiltrating water from entering the same aquifer from which it was pumped" (emphasis added) (Fox Comment Letter, p. 18). This is contrary to the three instances described above where Carlson concluded that the "less permeable" or "low permeable" layer exists, and therefore vertical seepage from the pond is "much less" or it "may limit" the quantity of vertical recharge. Carlson's conclusion is in keeping with the DEIR's conclusion that "a portion of this water [in the pond] would infiltrate back to the groundwater basin" (DEIR, p. 4.7-11).

Once the water percolates below the less permeable surface layer, albeit slowly, the basalt layer beneath "has a very high hydraulic conductivity (ability to transmit fluids) because of the many interconnected pore spaces occurring as shrinkage cracks or joints, fractures due to mechanical forces, and as cavities between lava flows" (Carlson 11/4/86, p. 6). All of the above information simply demonstrates what the DEIR concluded, that some "portion" of the water extracted from the aquifer would find its way back to the groundwater basin.

Response to Comment 14-34

Comment noted. Please see General Response to Entire Comment Letter 14. The entire project was assessed for the impact of consuming 4.5 million gallons (13.8 acre-feet) of water annually. This annual groundwater consumption limit as analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

The DEIR does not conclude, as the commentor suggests, "that the project's water use would not result in impacts because it recharges the aquifer" (Fox Comment Letter, p. 19). For a discussion of what the DEIR concludes regarding the role of the retention basins and recharge of the aquifer, please see Response to Comment 14-33.

Response to Comment 14-35

Comment noted. The discussion of previous groundwater use at the mill site serves to provide additional anecdotal evidence of the disparity of groundwater consumption between the previous land use on the property and the proposed aggregate project. According to the Carlson Report, "a large pond (approximately 40 acres) . . . [was] supplied by the constant pumping of groundwater" (Carlson 11/4/86, p. 2). According to Larry Mason, former manager of Louisiana Pacific, a 4,000 gallon per minute (gpm) pump ran 24 hours a day, 7 days a week, for the warmest 6 months of the year for the life of the saw mill project. The 4,000 gpm pump ran the other 6 months, but was not pumping 24 hours a day. To put this into perspective, this pump may have extracted 5.76 million gallons of groundwater per day. The proposed aggregate project intends to use 4.5 million gallons *annually*, or 1 million gallons less than the previous land use consumed in a single day! This comparison is not intended to dismiss the potential environmental impacts of the proposed project, but simply provides a context for the proposed project in comparison to a historical use.

As suggested by the commentor, "[t]he existing physical environment is normally the baseline condition against which a project's environmental impacts are measured" (Fox Comment Letter, p. 19). This is precisely what the DEIR analyzed in *Impact 4.7.6*, comparing the proposed project's groundwater consumption of 4.5 million gallons, or 13.8 acre-feet, against a water budget for the Burney Basin developed for the proposed Three Mountain Power Plant project (Bond, 2000).

For clarification regarding the commentor's concern, the DEIR, on page 4.7-11 and 4.7-12, is modified to read as follows:

> ~~The project site was once the location of a sawmill and a planing mill. A log pond, now empty, remains on the project site from these former operations. The pond is 21.93 acres in size. Assuming that three feet of water was maintained in the log pond, this would mean that the log pond held approximately 21.4 million gallons of water. The source of this water was from wells on the site. Not only was groundwater used to fill the log pond, but it was used to replenish pond water lost by evaporation and by percolation. In addition, groundwater was used to fill the former plywood pond south of the log pond. The plywood pond was approximately nine acres in size. Finally, water was consumed by lumber processing operations, although the amount consumed is not known.~~
>
> Concern has been raised regarding project impacts on flows ***to nearby falls, including*** ~~at~~ Burney Falls, ***wells, and natural springs*** ~~the water for~~ which **are** ~~is~~ supplied principally by underground springs. ***Regarding the project site, the Carlson Report states that historically "a large pond (approximately 40 acres) . . . [was] supplied by the constant pumping of groundwater" (Carlson 11/4/86, p. 2). Not only was groundwater used to fill the log pond; it was used to replenish pond water lost by evaporation and by percolation. In addition, groundwater was used to fill the former plywood pond south of the log pond. And finally, water was consumed by lumber processing operations. According to Larry Mason, former manager of Louisiana Pacific, a 4,000 gallon per minute (gpm) pump ran 24 hours a day, 7 days a week, for the warmest 6 months of the year for the life of the saw mill project.***

The 4,000 gpm pump ran the other 6 months, but was not pumping 24 hours a day. To put this into perspective, this pump may have extracted 5.76 million gallons of groundwater per day. The proposed aggregate project intends to use 4.5 million gallons annually, or 1 million gallons less than the previous land use consumed in a single day. This comparison is not intended to dismiss the potential environmental impacts of the proposed project, but simply provides a context in comparison to the site's historical use. ~~Previous sawmill operations, with its large consumption of groundwater, have apparently not affected flows at the falls. Moreover, the main source of Burney Falls water appears to be the Burney Mountain-Crater Peak area, which would not be affected by the project.~~

Moreover, as discussed in more detail in Impact 4.7.6, the proposed project's maximum annual allowable groundwater extraction of 13.8 acre-feet (4.5 million gallons) represents 0.0000554 percent of the annual outflow in the water budget for the Burney Basin developed for the Three Mountain Power Plant project (see Table 4.7-1: Water Budget for Burney Basin) (Bond, 2000). The extraction of 13.8 acre-feet would represent 0.0001045 percent of the flow over Burney Falls utilizing the same water budget (Bond, 2000).

In addition, pumping will primarily take place during the summer construction months, and will be sporadic depending on specific project demands and dust abatement requirements. The fact that minor groundwater level drops associated with project pumping should rebound to natural levels quickly is supported by permeability testing conducted by Carlson in his hydrogeologic investigation for the site. He noted during constant discharge pumping tests that "[d]espite the relatively high pumping rates (up to 700 gpm in [one pump]) almost all of the observed drawdown occurred in the first minute to 30 seconds. Likewise when the pump was turned off, recovery of groundwater levels was faster than could be measured" (Carlson 11/04/86, p. 8). Given the relatively low demand ***on groundwater resources*** for the ***proposed*** project compared to historic***al*** uses~~,~~***; and the generally quick recovery rate of groundwater levels after pumping ceases, and because the maximum allowable annual groundwater extraction of 13.8 acre-feet (4.5 million gallons) represents a minor percentage of the overall outflow of the Burney Basin water budget outflow,*** impacts on groundwater supplies are considered ***less than significant.***

Response to Comment 14-36

Comment noted. Please see Response to Comment 14-34 and Response to Comment 14-35. This entire discussion is predicated on the false assumptions that between 410 acre-feet and 3,180 acre-feet per year could be pumped as part of the proposed project. The proposed project was assessed for the impact of consuming 4.5 million gallons (13.8 acre-feet) of water annually. This annual groundwater consumption limit as analyzed in the DEIR will become an enforceable permit condition in the Eastside Aggregates Conditional Use Permit, which is subject to regulation by the Shasta County Planning Department.

Response to Comment 14-37

Comment noted. Please see Response to Comment 14-35.

Response to Comment 14-38

Comment noted. Page 4.7-1 of the DEIR is modified to read as follows:

> Within the proposed commercial-light industrial zone, drainage generally flows in a south to north direction. However, this flow is intercepted at the northern end of the zone by a drainage ditch, which sends flows it receives eastward ***and then northward again where it settles in the undeveloped north end of the parcel site.***

Response to Comment 14-39

Comment noted. Please see General Response to Entire Comment Letter 14. The basic assumption of the commentor that 86 million gallons of potable domestic water per year would be utilized to wash aggregate is false.

Response to Comment 14-40

Comment noted. Page 3-18 of the DEIR is modified to read as follows:

> Sewer service would be provided by septic systems. ***Three separate septic systems were installed approximately 7 months ago to meet Shasta County specifications.*** Pacific Gas and Electric Company (PG&E) provides both electricity and natural gas to the project site. The project would require the extension of existing electrical and gas lines onsite, by a distance of 600-1,800 feet.

Response to Comment 14-41

Comment noted. The opinion of the commentor is presented here for consideration by the Board of Supervisors. Included in the DEIR are the conclusions of two site-specific studies, which indicate that the aquifer beneath the site is not expected to be significantly affected by blasting related to quarrying activity (DEIR, 4.7-12/13).

Response to Comment 14-42

Please refer to Response to Comment 13-2 and General Response to Entire Comment Letter 14 concerning design capacity issues. For traffic volume estimates, please refer to Response to Comments 14-44 to 14-47 below.

Response to Comment 14-43

Please refer to Response to Comment 13-2 and General Response to Entire Comment Letter 14.

Response to Comment 14-44

The Final EIR contains a more aggressive "worst-case" scenario that assumes asphalt production at the maximum allowable level. Traffic associated with the asphalt includes truck trips for materials required to produce asphalt. Please refer to Response to Comment 13-3 and General Response to Entire Comment Letter 14 concerning use of design capacity in estimates.

Response to Comment 14-45

Please refer to Response to Comment 13-2 and General Response to Entire Comment Letter 14.

Response to Comment 14-46

Appendix B of the Draft EIR explains the methodology used in estimating traffic generated from the proposed C-M zone. The estimate given by the commentor overestimates potential trips for two reasons.

First, the commentor uses factors for light industrial uses. The only uses proposed are an outdoor sales area for landscaping material and concrete trailer rentals, and a truck repair shop. The outdoor sales area is more commercial in nature and more akin to a wholesale nursery than a general light industrial use. Trip generation factors are available for wholesale nurseries. The repair shop would be only for vehicles owned by Hat Creek Construction; thus, few trips are expected to be generated by this activity.

Second, the commentor assumes that the entire acreage of the proposed C-M zone would be used. In fact, only a portion of the C-M zone would be used for proposed activities. Thus, an estimate of trips based upon total acres of the zone would tend to overestimate actual trips. A more realistic factor was used in Appendix B of the Draft EIR that is based upon total employees.

The assumption made about potential commercial use of the repair shop is irrelevant, as the facility would be used only for the repair of vehicles owned by the project applicant. If the repair shop desired to expand its operations to include commercial truck repair, it would need to obtain another Use Permit for such activities. The Use Permit would be subject to environmental review.

Response to Comment 14-47

Please refer to Response to Comment 13-2 and General Response to Entire Comment Letter 14.

Response to Comment 14-48

Please refer to Response to Comment 11-7.

Response to Comment 14-49

Please refer to Response to Comments 11-7, 13-2 and General Response to Entire Comment Letter 14. Based on Caltrans traffic counts statistics and road configuration specifications (i.e., road shoulder width), the Initial Study for the proposed project stated that 1,000 vehicle trips per day would need to be added to decrease the LOS on State Route 89 to "B". Even under the highly aggressive "worst-case" scenario analyzed in the EIR, there would not be that level of increase in traffic.

Response to Comment 14-50

Please refer to Response to Comments 11-7, 13-2 and General Response to Entire Comment Letter 14.

Response to Comment 14-51

Most f the roads that would be used by project traffic would be state highways, mainly State Routes 89 and 299. State highways are constructed to accommodate heavy truck traffic. Also, please refer to Response to Comment 11-147.

Response to Comment 14-52

The submittal by Dr. Fox makes two main points concerning project impacts on public health:

1) Diesel Exhaust Impacts (to public health) are significant

2) Impacts from exposure to crystalline were not evaluated and are significant

Section IV.A of her submittal evaluates public health impacts by estimating the exposure concentration of diesel particulate matter at several sensitive receptors and concludes that lifetime cancer risks to individuals living near SR 89 would range from 14 to 125 cancers per million. The analysis further indicates that actual risks would be 593 to 5,337 cancers per million.

Section IV.B of her submittal evaluates health impacts from exposure to crystalline silica and concludes that cancer risk to individuals in the vicinity of the project would increase by 30 cancers per million.

Responses to her individual comments are given in this section and are provided below.

<u>Cancer Risk From Diesel Trucks</u>

The maximum cancer risk to nearby residents is estimated to be 0.0579 cancers per million under the average production scenario (10,000 cubic yards/yr) for 30 years. This risk level is based on refined modeling using local meteorological data as discussed in this section. A summary of the modeling results and risk calculations are provided in Appendix B.

If in a given year production exceeds 10,000 cubic yards, then it would have to be reduced in subsequent years or the life of the project would have to be shortened since there is a limit of 900,000 cubic yards of aggregate production for the entire project. This means that public cancer risk would not change since public health risks are related to total emissions over the duration of the project, not just emissions in a given year.

The risk estimate is based on modeling the trailer park located 280 feet west of SR 89. A 1 km segment of SR 89 was modeled using one year of hourly local meteorological data (Soldier Mountain) to calculate annual concentration of PM-10 at the trailer park. The maximum 70 year cancer risk was calculated by multiplying the annual concentration by a unit risk factor for diesel particulate (3.0×10^{-4}). Since the project life is 30 years, the risk was adjusted by a factor of 30/70. This leads to a cancer risk of 0.1 cancers per million.

This cancer risk is considered insignificant and is below the threshold of 10 cancers per million used by SCAQMD for public notification. This same threshold is used under Proposition 65 for public notification. Given the highly aggressive "worst-case" production scenario used in the analysis, it is reasonable to conclude that there would be no significant cancer risk to the public from this project.

Risk to workers was calculated by adjusting the 30 year residential cancer risk to allow for a more limited exposure: 8 hrs/day, 5 days/week, 50 weeks/yr for 30 years. This leads to a worker risk of 0.0132 cancers/million. Again, this level of risk is considered insignificant.

The above cancer risk calculations are based on a diesel particulate emission rate of 1.0 grams/mile. It is recognized that older diesel trucks will have higher emission rates. According to ARB, using EMFAC7G, the emission rate of PM-10 from diesel trucks is 2.28 grams per mile for older trucks (1956-1990) during summertime conditions. This emission factor was also used in the DEIR. Use of this emission factor overstates future truck emissions since newer trucks will be required to meet stringent emission standards and therefore, would have much lower emissions. Consequently, an emission rate of 1 gram/mile used in this analysis is reasonable. Even if an emission factor of 2.28 grams/mile were used and even if the truck volume were doubled, the cancer risk would remain less than 1 cancer per million.

Finally, it is important to note that if the project were not built, asphalt and concrete would have to be secured from other, more distant sources. This would result in similar, if not higher, air quality impacts and impacts to public health. There has been no attempt to estimate these impacts, however, they should be noted in the overall discussion of project impacts.

Cancer Risk From Exposure to Crystalline Silica

Health risks from exposure to crystalline silica were not evaluated because this substance is not regulated as a human carcinogen in California. According to the Office of Environmental Health Hazard Assessment (OEHHA), the use of recommended exposure levels for crystalline silica is on hold until it can be peer reviewed. A copy of the letter from OEHHA is attached (Appendix D). Until, OEHHA makes a definitive statement or determination that crystalline silica is a human carcinogen and recommends a Reference Exposure Level (REL), the project is not required to include this substance in the risk analysis.

As noted in Appendix D, crystalline silica is not regulated as a human carcinogen by the Office of Environmental Health Hazard Assessment (OEHHA), and therefore it was not included in the risk analysis.

Response to Comment 14-53

There are two sources of diesel emissions – diesel powered quarry equipment and diesel fueled trucks. Of these two sources, emissions from trucks have a greater impact in terms of annual emissions. Therefore, truck emissions were the initial focus.

The production of 8,000 cubic yards of concrete and 10,000 cubic yards of asphalt would require approximately 1,658 truck trips to haul these products to off-site locations. This number of truck loads and trips is based on each asphalt truck hauling 24.5 tons/load and each concrete truck hauling

9.5 cubic yards per load. For example, to haul 8,000 cubic yards of concrete would require 8,000/9.5 = 842 truck loads.

Cancer health risk associated with this truck traffic was evaluated and included a refinement of the screening level risk analysis presented in the DEIR. Previously, health risks from diesel trucks were not analyzed. In addition, previous analysis used only hypothetical worst-case meteorological data that was not representative of the project area. The following procedure was used to calculate cancer risk to residents at Burney Falls Mobile Park.

- Model a 1 km segment of SR 89. The segment would extend 0.5 km north of the trailer park and 0.5 km south of the trailer park. Assume every truck leaving the project site would travel across from the trailer park.
- Estimate number of annual trucks and diesel emissions assuming average production levels. For this calculation, assume each truck emits 1 grams PM-10 per mile and assume all the trucks travel on this segment of SR 89.
- Model the roadway as an area source (1 km long x 24 ft wide).
- Place a receptor 280 feet West of highway to represent the trailer park.
- Use ISC3 dispersion model with one year of hourly wind speed, wind direction and temperature data and calculate the annual concentration of PM-10 at the trailer park. Copies of the model output are included in Appendix C.
- Estimate 70 year residential cancer risk by multiplying the annual concentration by a unit risk factor for diesel particulate (3.0×10^{-4}).
- Adjust risk for other exposure scenarios - 30 year residential risk and worker risk.

The result of this analysis show that the maximum 30 year cancer risk at the trailer park is approximately 0.1 cancers per million. The risk to workers is estimated to be 0.03 cancers per million. Both of these cancer risks are considered insignificant and are below the threshold of significance of 10 cancers per million. These are the same conclusions reached in the DEIR. Even if the emissions from individual trucks were doubled or quadrupled, the health risks remain insignificant.

If production is increased in a given year (for example to the 100,000 cubic yards annual maximum for asphalt), it would obviously increase the number of truck trips. However, any increase in production would have to be offset by either (a) reducing production in other years and/or (b) shorten the life of the project from 30 years to some lower number. Both of these factors would reduce risks to the public. This would offset increases from emissions due to an increase in additional truck trips that would accompany any increase in production in a given year.

As a result, health risks calculated using average production levels for 30 years are representative of the proposed project and this risk. Overall risks to the public will not increase if production is increased or decreased in a particular year as long as the project ceiling of 900,000 cubic yards of quarrying is not exceeded.

Response to Comment 14-54

Response not required. Comment describes the procedure that was used to calculate cancer risk from diesel particulates. It is important to note, however, that if one chooses to use ambient concentrations of toxic pollutants to estimate risk, then one must use local ambient concentration of toxics. Since the issue is chronic (long-term) exposure to a toxic cancer causing pollutant, one must establish the long-term (minimum one year) of ambient concentration.

Response to Comment 14-55

Comment noted. The modeling analysis specifically modeled the concentration of diesel particulate at the Burney Falls Trailer Park located 280 feet West of SR 89. In an effort to be highly conservative, it was assumed for purposes of this analysis that all trucks coming or leaving the proposed project site would travel along SR 89 near the trailer park, even though realistically this would not be the case. This represents an aggressive "worst-case" assumption and overstates the actual risk.

Impacts at other locations (i.e., the Town of Burney, Mountain Christian Academy School) would be lower, as only a fraction of the trucks from the project would travel near these locations. Risks at these locations can be inferred from the results at the trailer park. Given the low level of risk, the number of trucks could be doubled without exceeding the 1 cancer per million risk threshold of significance mentioned by Dr. Fox.

Response to Comment 14-56

A response is not required. The calculation of 70 year and 30 year exposure duration is correct. Risks at the 30 year exposure is based on the exposure duration.

30 year risk = 70 year risk x (30yrs/70yrs)

The results of 70 year, 30 year and worker risk are summarized in Response to Comments 14-52 and 14-53. The calculations are provided in Appendix B.

Response to Comment 14-57

The approach used by the commentor to establish exposure concentration of diesel particulate in the vicinity of the roadways near the project location is incorrect. The approach used data from a coastal site that had higher wind speeds, and did not represent the directional variability that occurs in the Burney area. For example, winds in the Burney area often blow from the northwest. This means that many receptors such as the trailer park and the town of Burney would be upwind of the project site.

It is erroneous to conclude that each truck would increase the ambient concentration by 0.33 ug/cubic meters based on off-site data and without doing any measurements at or near the project site. Clearly, this assumption is wrong if the emission source is located downwind of the receptor.

The analysis used this information to characterize the concentrations near SR 89 and then proceeded to calculate cancer risk associated with exposure to this concentration level (per truck). Unless the local winds are taken into account it is impossible to determine the cancer risk at a specific location.

The correct approach is to either use local ambient measurements to characterize the concentration of toxic pollutants or alternatively use dispersion and emissions models with local wind data to establish a concentration pattern which is then used to calculate risk. For this analysis the latter approach was utilized.

Response to Comment 14-58

Since the commentor's approach for establishing exposure concentrations is flawed, the risk calculations presented in this section are not representative since they are not based on any local wind data or any local measurements of diesel particulate.

There is also a problem with the assertion that use of average production levels would underestimate the actual risk to the community. As noted in Response to Comment 14-53, if the project operates at higher production levels on a given year, then either production would have to be reduced in subsequent years or the life of the project would have to be shortened to less than 30 years. The total amount of emissions over the life of the project would remain the same due to limits place on the project by the Conditional Use Permit.

Response to Comment 14-59

See Response to Comment 14-52.

Response to Comment 14-60

See Response to Comment 14-52.

Response to Comment 14-61

A response is not required. It is important to note, however, that background cancer risk in most cities in California ranges from a few 100 cancers per million to over 1,000 cancers per million. Cumulative cancer risk would equal this background risk plus project risk. Since cancer risk from the proposed project is estimated to be less than 1 cancer per million, there would not be a significant cumulative risk impact.

Response to Comment 14-62

As noted in Appendix D, crystalline silica is not regulated as a human carcinogen by OEHHA or by the County and, therefore it is not necessary to evaluate health impacts from its exposure.

Response to Comment 14-63

Air quality emissions and impacts have been revised to reflect a more aggressive "worst-case" production scenario. See Appendix E for the revised emissions and air quality impact summaries. The impact summaries, like the DEIR, show that the proposed project would comply with applicable

Shasta County AQMD rules and regulations. See Appendix F for a listing of applicable requirements and a demonstration of compliance.

In response to concerns noted by several commentors, air quality impacts were re-evaluated using a more aggressive "worst case" production scenario. The evaluation included (1) revising the emission rates and (2) using a refined air quality dispersion model (ISC3) supplemented with local meteorological data to estimate project impacts. The use of local meteorological data is a significant refinement since the analysis in the DEIR was conducted using worst-case (screening level) meteorological data without any regard to local wind patterns.

The results of the refined analysis shows that project impacts were significantly overestimated in the DEIR. A comparison of the refined impact analysis with the impacts presented in the DEIR is summarized below:

	Current Refined Analysis	Screening Level Analysis (DEIR)
PM-10 (24 hour)	21 ug/cubic meters	50 ug/cubic meters
PM-10 (Annual)	3 ug/cubic meters	13 ug/cubic meters
NOx (Annual)	0.007 ug/cubic meters	7 ug/cubic meters
SO_2 (24 hr)	6.1 ug/cubic meters	21 ug/cubic meters

It is important to note that as compared to public health risks, air quality impacts are assessed for shorter time scales. Air quality impacts are evaluated for 1-, 3-, 8-, 24-hour and annual time periods. These periods correspond to the time periods inherent in California and Federal air quality standards. Table 4.3-1 of the DEIR lists the standards and time periods.

The reevaluation analysis, like the DEIR, determined that there would not be significant air quality impacts associated with the proposed project. Specifically, the results show that project emissions would remain below levels requiring emissions offsets. For each air pollutant, the revised analysis shows that impacts will be lower than originally estimated in the DEIR. This is because the current analysis uses a refined air quality model (ISC3) with local meteorological data. The project would not violate any State or Federal ambient air quality standard. Previously, a screening level analysis was performed using worst case meteorological data. The results of the revised analysis are summarized in Appendix E. A copy if the dispersion model output is provided in Appendix 3. Compliance with applicable air quality regulations and requirements are summarized in Appendix F.

Response to Comment 14-64

The issue of project definition and maximum versus average operational scenario is discussed in Response to Comment 14-53. As noted in this discussion, it would be erroneous to conclude that the project could operate at the maximum design capacity for 30 years. Therefore, project emissions were not underestimated.

Response to Comment 14-65

Please see Response to Comment 14-64.

Response to Comment 14-66

BACT thresholds would not be exceeded if the project operated at the maximum daily throughput rate. The thresholds vary by pollutant, but for the most common air pollutants, BACT is triggered of emissions exceed 25-80 lbs/day. Nevertheless, the project would use the following control technologies to mitigate emissions from the asphalt plant. These technologies are considered BACT as reported in CARB's BACT Clearinghouse.

Dust/PM-10	Fabric filters
NOx	Low NOx burners, PUC grade natural gas or propane
SOx	PUC grade natural gas or propane
VOCs	The main source of VOCs are fugitive emissions from hot oil tank and during material transfer operations. BACT for these sources consists of good maintenance and may include blue smoke carbon filters.

Given the use of these technologies, the project would meet or exceed minimum BACT requirements.

Response to Comment 14-67

Project emissions do not exceed 25 tons/year for any regulated air pollutant. Therefore, emission offsets are not required. Revised project emissions are given Appendix E.

Response to Comment 14-68

Emissions from the sources noted in this comment would be minor compared to the emissions included in the project. Given the aggressive "worst-case" production scenario used to evaluate emissions and impacts, inclusion of these additional sources would not trigger any new air quality requirements or require any additional mitigation measures. For example, the main source of emissions at asphalt plants are the drum mix stack. Emissions associated with material handling are minor and easily mitigated using water sprays. Wind erosion of aggregate piles or sand piles is not a source of PM-10 as the particle size of these materials exceeds 100 micrometers. Overall, the contribution from the additional sources noted in this comment would not alter the significance of projected impacts.

Response to Comment 14-69

Comment noted. Construction of the truck repair facility would involve some grading and trenching. The area affected, however, would be less than one acre and the construction activities would be limited to a few days. No more than 10 cubic yards of soil would be moved. As a result, emissions would be de minimis, especially in light of the fact that the project's air quality impacts do not approach significant thresholds.

The 1.2 tons of PM per acre per month is an unmitigated emission factor. If it is assumed that 50% of the dust is PM-10, then the unmitigated factor is 40 lbs. of PM-10 per day per acre. Since 90% control can be achieved by watering and if the grading and trenching lasts 3 days, the controlled emissions would be 12 lbs. for the 3 day period or 4 lbs/day.

Equipment exhaust emissions would be as follows assuming 10 cubic yards are moved:

PM-10	22 grams (0.05 lbs)
CO	1,380 grams (3.0 lbs)
VOCs	92 grams (0.2 lbs)
NOx	424 grams (0.9 lbs)
SOx	46 grams (0.1 lbs)

These emission rates are based on emission factors recommended by BAAQMD's CEQA Manual (1996), Table 7, page 28 for heavy-duty construction equipment. These emissions are insignificant relative to the overall project.

Response to Comment 14-70

From visual observations at other asphalt plants, the amount of VOCs released during truck loading and raw asphalt storage are not significant as compared to emissions from the dryer stack. Furthermore, there are no reliable emission factors recommended by the EPA on quantifying such emissions. The data provided by the commentor in Exhibit 29 is preliminary and has not been officially released by the EPA and, therefore, cannot be used to estimate emissions.

Fugitive dust emissions from aggregate handling were included in the analysis in the DEIR.

Response to Comment 14-71

Comment noted. Please see Response to Comment 14-68.

Response to Comment 14-72

Comment noted. Please see Response to Comment 14-68.

Response to Comment 14-73

Originally, the plant was to be duel fueled. Therefore, emissions from both natural gas combustion and fuel oil were calculated. Current specification of the project requires the use of natural gas or propane. Hence, current emissions are based on use of natural gas only.

Response to Comment 14-74

Truck and vehicle emissions were taken from the ARB Report "Methodology for Estimating Emissions from On-Road Motor Vehicles", Vol. 2 EMFAC7G (November 1996). Emissions for summer time travel for autos and trucks is based on Table 1 of this report. Auto emissions are based on catalyst equipped cars while truck emissions are based on heavy-duty diesel fueled trucks. It is noted that future emissions will be lower than these values in response to more stringent standards currently being promulgated by the ARB. Trip length is estimated to be 30 miles average round trip. Please see Response to Comment 14-4 for additional discussion on the choice of emission factors of PM-10 from diesel trucks.

Response to Comment 14-75

Comment noted. Odors would be controlled by use of odor counteractants, good maintenance, possible use of blue smoke carbon filters and possible use of thermal oxidizer on the main stack. Collectively, these measures will eliminate odors from asphalt production. See Response to Comment 8-2.

Response to Comment 14-76

The proposed project would not exceed the thresholds for VOCs and therefore, would not exceed the Levels "A" or "B" significance thresholds in the General Plan. Future NOx emissions from mobile sources would be significantly lower than the worst-case emissions presented in the DEIR. For example, future NOx emissions from diesel trucks are proposed to be 50% to 75% lower than current standards. As a result of these anticipated reductions, the project would not exceed emission thresholds.

Response to Comment 14-77

We concur with the commentor's description of the project location, existing residences, and known noise-generation associated with aggregate mining and processing facilities. The commentor's assertion that the DEIR dismisses noise as a concern because the site was formerly used as a lumber mill is incorrect. The reference to the former use of the site in the DEIR was for acoustical context only, and no attempt was made or considered to adjust current ambient conditions to reflect those present while the lumber mill was in operation.

The commentor is correct in that the CNEL descriptor applies a 5 dB penalty (4.77 dB) to noise occurring during evening hours (7 p.m. to 10 p.m.), whereas the Ldn descriptor does not. However, the use of Ldn or CNEL to describe on-site noise impacts for this project would be considerably less restrictive than the use of the hourly average and maximum noise level standards which were applied in the DEIR. This is because the project will not operate 24-hours per day, but the Ldn/CNEL descriptors are 24-hour averages which include hours when the facility would not be in operation. By way of a hypothetical example, if the facility operates between 4 a.m. and 8 p.m. and generates a steady-state level of 46 dB Leq at the nearest residences (Table 4.8-5), the computed Ldn would be 48.6 dB after consideration of the 10 dB nighttime penalty. This level is a full 11 dB lower than the 60 dB Ldn standard applied by the County to residential uses. Conversely, the predicted nighttime noise level of 46 dB with all equipment running (hypothetical worst-case since mining and crushing/screening would not need to occur during nighttime hours due to stockpiling), is only 4 dB below the County's hourly average noise level standard. Incidentally, the computed CNEL under this same example is 48.7 dB, which indicates that the 5 dB penalty applied to the 1 evening hour of operation (7-8 p.m.) would have no appreciable effect on computed CNEL values relative to Ldn values.

This comment requires qualification. Noise by itself may or may not be considered a nuisance, result in sleep disturbance, cause mood swings, and the other symptoms described in this paragraph. The onset of these reactions to noise is dependent on many factors, not the least of which is intensity, which is ignored in this comment. If the predicted project-related noise levels were in excess of the standards considered acceptable by Shasta County and CEQA, then the reactions described above would be expected. However, the standards of significance were developed to prevent such reactions.

The DEIR clearly analyzes on-site noise impacts based on the hourly average and individual maximum noise levels, rather than based on 24-hour averages (please refer to Table 4.8-5 of the DEIR). With respect to sleep disturbance and maximum noise levels exceeding 50 to 55 dB Lmax inside bedrooms, Table 4.8-5 of the DEIR predicts maximum noise levels of 44 to 45 dB at the exterior of the nearest residences from early morning asphalt and concrete production. As stated previously, excavation and processing prior to 7 a.m. would reportedly not occur. Based on maximum exterior noise levels of 44 to 45 dB, levels inside the residences would be even lower, even if the facades of the residences provide only modest noise reduction. These levels are well below the 50-55 dB maximum standard described in this comment. With respect to maximum noise levels associated with heavy truck passages, the nearest residences would not be exposed to maximum noise levels of any greater than those which currently occur during early morning passages of logging trucks on SR 89.

Response to Comment 14-78

The statement in this comment that the DEIR analysis has significantly underestimated noise and failed to impose adequate mitigation is not supported in this paragraph.

We concur with the commentor's description of the acoustical terminology provided in this comment.

The effects of temperature and relative humidity on noise are non-linear and frequency dependent. It cannot automatically be concluded based on the assertion that relative humidity is generally high in the area that significant atmospheric attenuation will not result. In addition, the frequency content of aggregate mining and processing equipment is broad-band in nature, not heavily weighted in the low frequency bands as described in this comment. The one exception is the asphalt plant, which creates low-frequency noise from the burner mechanism. Because there are limitless combinations of temperature, humidity, and wind and temperature gradients possible at the site, the DEIR specifically recommended the only definitive method to account for these factors; testing. If followup tests indicate that asphalt plant or other noise sources are exceeding the project standards of significance (for whatever reasons), additional noise control measured which are commonly used in this industry can and must be applied. With respect to the effects of reflections, the commentor is referred to the response provided to comment 12-8.

These paragraphs contain a continuation of the discussion of atmospheric effects on project-generated noise levels, particularly temperature inversions. Variations in atmospheric conditions are an everyday phenomenon. Under strong temperature inversion conditions, noise levels received at the nearest residential areas could be higher than those predicted in the DEIR. However, the degree of the noise level increase is dependent on several factors, with the two most important being the altitude and intensity of the gradient at the inversion altitude. If the gradient occurs at high altitudes, the angle of incidence will be too large, and sound will generally pass through the inversion layer, rather than refract back off of that layer towards the ground. If the inversion layer is low, sound will refract off of the layer and back towards the ground prior to reaching the nearest residences. During periods when inversion conditions are optimum for the propagation of sound over large distances, noise level increases of up to 10 dB are possible as the commentor notes. It should be noted, however, that because the inversions do not discriminate by noise source, those same inversion characteristics would affect other noise sources in the area, such as traffic on SR 89, thereby increasing ambient conditions not caused by the project.

As noted by the commentor, noise levels predicted in the DEIR are NOT predicted to exceed the County's noise level standards. In addition, the supplemental noise monitoring conducted during early morning hours indicates that the predicted levels would not substantially exceed existing ambient noise levels. If no exceedance of the project's standards of significance are identified, CEQA does not require that noise mitigation measures be required. The potential impact identified for the cumulative operations of all the project-related equipment during early morning hours was, in fact, identified as a precautionary measure to force follow-up monitoring. Since the applicant has stated it is not necessary to either excavate or crush/screen prior to 7 a.m., the potential significance of this impact is greatly diminished and could, theoretically be removed. Nonetheless, although efforts were made to apply conservative assumptions in this analysis (no credit for berm or trees, etc.), the follow-up noise testing remains a prudent measure, and will ensure that the project is operating in compliance with the standards of significance. If it is not, the types of measures which are described on page 65 of this comment letter and those specified in the DEIR can be implemented.

Response to Comment 14-79

This is a summary paragraph, with the supporting text in subsequent paragraphs. Specific responses to this comment are, therefore, provided in subsequent responses.

Response to Comment 14-80

The commentor is correct in that the DEIR reports the modeled traffic noise levels for existing and project conditions separately, and indicates the theoretical increase in traffic noise levels which would result from project truck traffic.

Response to Comment 14-81

The commentor is correct in that the County's exterior noise level standard for residential uses is 60 dB Ldn, and that when the theoretical existing plus worst-case traffic noise levels are combined, the total noise level would be 61.2 dB Ldn. Noise impacts were not identified for this condition for the following reasons. First, and most importantly, the project-related traffic level increase for worst-case conditions was below the "substantial increase" threshold of significance. Second, traffic noise impacts are most commonly assessed relative to typical day conditions, and the truck traffic noise levels predicted for typical conditions would be at or slightly below the County's 60 dB Ldn threshold. Nonetheless, if worst-case traffic noise levels were to be used for noise impact assessment, a fair comparison of worst-case project-related traffic noise levels would require comparison against worst-case existing no-project traffic conditions, rather than against the annual average conditions which were used in the DEIR to establish existing conditions. Third, the assessment of traffic noise levels did not include any correction for shielding provided by the intervening trees. Follow-up noise level measurements conducted at the trailer park indicated that existing traffic noise levels are, in fact, affected by the intervening tree cover. Had that shielding been included in the calculations, even the existing plus worst-case traffic noise levels would not have exceeded 60 dB Ldn. Finally, the truck noise analysis assumed that all of the project-related truck traffic would travel north on SR 89 upon leaving the site, which is undoubtedly conservative. When all of these factors are considered together, we believe the rationale for not identifying a significant project-related traffic noise level increase is sound. In addition, please see Responses to Comments 12-23 and 12-24.

Response to Comment 14-82

The analysis of truck traffic noise level was indeed conservative for the reasons cited in the response to comment 14-81. It is more speculative to assume that each and every truck which leaves the project site on its worst case day of business would travel north, than to assume the opposite. The finite roadway adjustment included in the FHWA Model is just that; a correction if the receiver has a finite view of the roadway (a portion of the roadway is shielded). The finite roadway adjustment is not applied in cases where the traffic does not even pass by the receiver. Although some noise from trucks heading south on SR 89 may be audible at the nearest receivers, it will be more than 10 dB below the noise received from trucks heading north on SR 89, and would therefore have an insignificant contribution to the traffic noise levels received at those residences. In addition, please see Response to Comment 12-39.

Response to Comment 14-83

The FHWA Model results can be confirmed using the FHWA Model (with Calveno Curves), with the input data contained in the DEIR without the use of finite roadway adjustments. No finite roadway adjustments were included in the traffic noise analysis.

Response to Comment 14-84

The identification of a potentially significant noise impact for cumulative on-site equipment noise was not due to an exceedance of any County noise standard. It was identified due to the potential for early morning noise levels to substantially exceed ambient noise levels. This is consistent with the DEIR's evaluation of traffic noise impacts.

Response to Comment 14-85

The commentor is correct that, if SR 299 has higher traffic volumes than SR 89, and if the truck percentages are higher, then traffic noise levels would be higher along that roadway segment. However, as background traffic noise levels increase, the increase in noise due to the project would decrease, not increase, since the project-related traffic would make up a smaller percentage of the total traffic.

Response to Comment 14-86

The commentor asserts that 63% of the project traffic would head west on SR 299 from the junction of SR 299 and SR 89. This comment is in conflict with the earlier comment that asserts 100% of the traffic would head north on SR 89.

Response to Comment 14-87

Because no traffic noise impacts were identified at existing residences located nearest to SR 89, the assessment of noise impacts on the more heavily traveled SR 299 were not evaluated. This is because the project-related contribution of noise to the overall traffic noise environment would be even less significant than the project-related increase projected for SR 89. If the traffic volumes on SR 299 are twice as high as existing traffic volumes on SR-89, and if the nearest residences to the roadway are closer than 200 feet as asserted by the commentor, then the existing no-project traffic noise levels at those residences located closest to SR 299 would already exceed 60 dB Ldn. It should be noted that under the conditions described in Response to Comments 14-81 and 14-82, because of restrictions in the overall production volumes and due to local market conditions, these impacts would only occur for short time periods during the construction season over the 30-year life of the proposed project.

Response to Comment 14-88

Please see Responses to Comments 13-2, 14-44, 14-46, and the General Response to Entire Comment Letter 14.

Response to Comment 14-89

Please see Responses to Comments 13-23, 14-44, 14-47, and the General Response to Entire Comment Letter 14.

Letter 15

October 14, 2000

Frank Wilkins
24442 Black Ranch Road
Burney, CA 96013

Ross Mull
Shasta County Department of Resource Management
1855 Placer Street
Redding, CA 96001
RE: Eastside Aggregates Project #2000062079

Dear Mr. Mull:

I have reviewed the EIR for the project and have the following comments:

Impact 4.3.4 Asphalt Plant

I am concerned with the odors the plant will produce, but I am comfortable with the mitigation, as written. 15-1

Impact 4.7.1 Project operations may contaminate groundwater in the aquifer beneath the project site.

Although the EIR does not say how much of a substance must be spilled to contaminate the aquifer, this item is considered as "significant." MM 4.7.1a is really only information for employees, it does not mitigate or provide any response to actual spills or contamination. To me, as a homeowner dependent on the aquifer, a more reasonable mitigation would contain three components: 1) Water testing from wells providing drinking water to residents in the area, to provide a baseline of present water quality. 2) A HAZMAT response plan. 3) A guarantee that, should they temporarily or permanently contaminate the aquifer and wells, they have a contingency in place to supply my residential water needs without the need for litigation. 15-2

Project Alternative 4-Restricted Hours of Operation

I would like the project to be held accountable for early morning noise. I realize the construction industry starts early, although 4 a.m. is pushing it. How many complaints of early morning noise (before 6 a.m.) will be needed to restrict the hours of operation? 15-3

Thank you for taking my comments.

Sincerely,

F.A. Wilkins

Frank Wilkins

Letter 15 Frank Wilkins, County Resident

Response to Comment 15-1

Please refer to Response to Comment 8-2.

Response to Comment 15-2

Comment noted. Please refer to Response to Comment 10-20.

Response to Comment 15-3

Comment noted. Potential noise impacts were identified, along with appropriate mitigation measures to reduce these impacts. Response to Comment 13-3 discusses an aggressive "worst-case" scenario where noise associated with simultaneous production and truck traffic is considered. A situation like this will be extremely rare, and may not happen at all. For a full discussion of responses to comments related to noise please see Response to Comments 12-1 through 12-71 and 14-77 through 14-89.