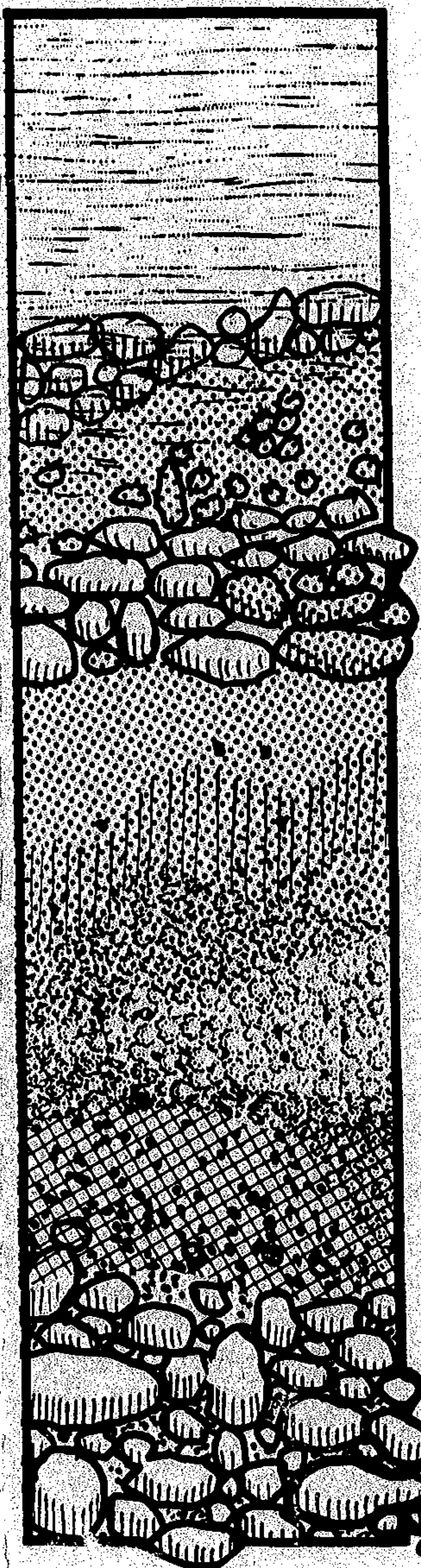
CORONA QUARRY



CalMat

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REPORT

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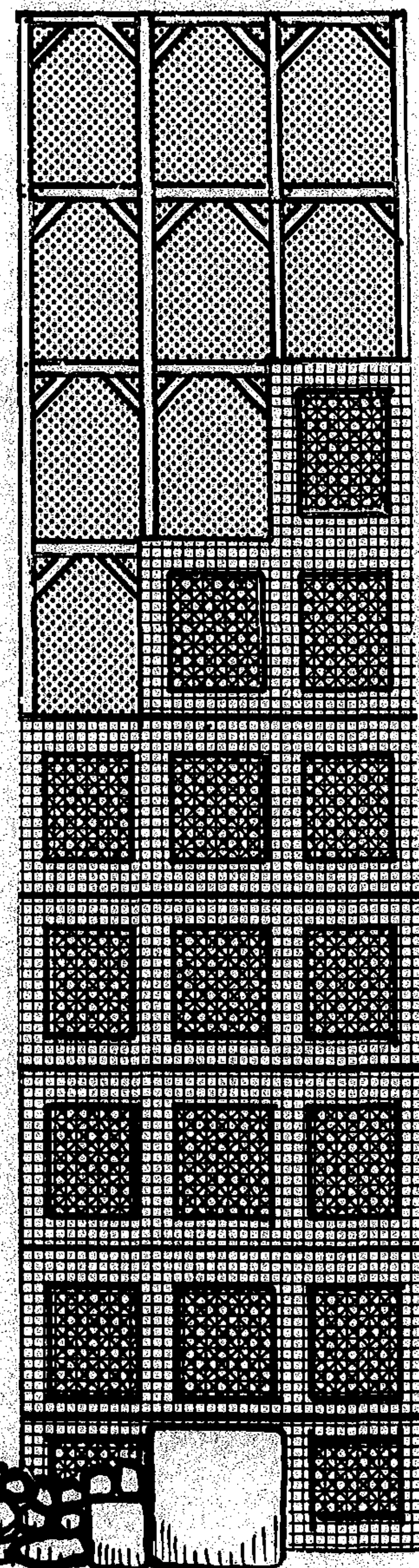

FLORIAN MARTINEZ ASSOCIATES

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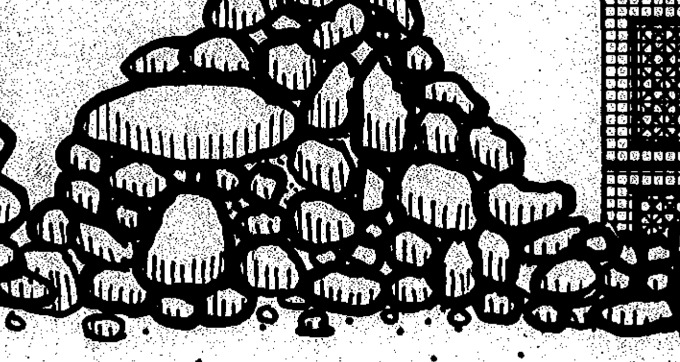

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CORONA QUARRY

(Riverside County SMP No. 168)

Environmental Impact Report

(Riverside County No. 316)
(SCH No. 88081517)

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1.0

INTRODUCTION

1.0
INTRODUCTION

1.1 PURPOSE AND SCOPE

This Environmental Impact Report (EIR) has been prepared pursuant to the State of California's *Guidelines for Implementation of the California Environmental Quality Act (CEQA)* to evaluate the potential impacts of the proposed construction aggregate mining operation in the Temescal Valley region of Riverside County. The purpose of this document is to inform decision-makers and the general public of any significant adverse environmental effects associated with the proposed actions, and to identify measures which may be taken to minimize these effects.

The project site is known as the Corona Quarry. It is located near the Temescal Wash, east of the City of Corona, in an unincorporated portion of Riverside County. (See Figures 1 and 2.) The project applicant, CalMat Co., proposes to mine and process rock from this site in quantities of from 300,000 to over 5 million tons per year, dependent upon resource quality and market conditions. Additionally, the applicant proposes to implement a reclamation plan concurrent with and following completion of mining operations. The reclamation plan will provide for the rehabilitation and reuse of mined areas.

This document has been prepared as a "Focused" EIR, under the direction of the County of Riverside, which is the Lead Agency for this project. The focused scope of this EIR reflects the environmental setting of the site and the general characteristics of the proposed project. The applicant has filed for a Surface Mining Permit (No. 168) and Reclamation Plan application with the County of Riverside to enlarge upon the existing Surface Mining Permit and Reclamation Plan. This application was reviewed by the Planning Department, who prepared an Environmental Assessment Evaluation of the project. Based upon this information, the County determined that the project may have significant effects on the environment and an EIR should be prepared to focus on the following issues:

1. <u>Hydrology</u> - There may be hydrology-related impacts associated with the mining, including drainage, erosion, flooding, groundwater, surface and subsurface water quality. The Environmental Assessment indicated that erosion of soils on this site is considered high on slopes of 15-50 percent. Mining will disturb large areas of the site, thus increasing the potential for this hazard. The westerly portion of the site, along Temescal Wash, is in a 100-year floodplain and the dam inundation area for Lake Mathews. Proposed processing facilities will be sited within this 100-year floodplain. The Riverside County General Plan indicates that heavy industry is generally unsuitable in floodplains unless a site investigation indicates that hazards can be mitigated. Impacts to groundwater and surface water quality may result from this project, especially with regard to the wash-water used for screening and washing of aggregates.

2. <u>Noise and Vibration</u> - Noise and vibrations from the proposed mining (including blasting) and processing, as well as from truck traffic, may impact adjacent neighborhoods, such as Home Gardens and El Cerrito. Similar to adjacent mining properties, hours of operation will be restricted to daytime hours in order to mitigate noise and vibration impacts to the nearby land uses.

3. <u>Air Quality</u> - The cumulative effects of dust, mining and processing, vehicular emissions, and the production of asphalt typically associated with such operations may cause significant effects to regional air quality.

4. Biological Resources - Mining and processing may produce impacts upon the riparian and coastal sage plant communities. Portions of the east end of the site are within the range and habitat of the Stephens kangaroo rat, a federally- and state-listed endangered species. Sensitive species may exist in the portion of the site traversed by Temescal Wash, although this area has been disturbed by mining in the past. Habitats will be eliminated by mining.

5. Archaeological Resources - The possible existence of these resources are unknown at this time. Study is necessary to determine if any impact upon historical or archaeological resources is possible.

6. Visibility and Aesthetics - Implementation of the Corona Quarry operation will cause significant impacts upon the local visual and aesthetic resources. The site is within one mile and within the view of the Corona Freeway, I-15, an eligible State Scenic Highway. Many mining and industrial uses are already visually impacting aesthetics in this area. The proposed mining operation will result in noticeable landform and topographic changes to the site. Over 1,000 vertical feet of elevation change are anticipated. On a clear day this operation will be visible from much of the surrounding area.

7. Circulation - Cajalco Street and Magnolia Avenue will be impacted by this project. Significant truck traffic will be necessary to haul the anticipated 5 million tons of rock, concrete, and asphalt from the site for the first 10 years alone.

8. Public Safety - The Corona Quarry project may generate public safety impacts related to site access and blasting.

9. Fire Hazard - The project is within a regional fire hazard area as identified by the Riverside County General Plan.

The Notice of Preparation (NOP) for this EIR was circulated and publicly reviewed for a 30-day period between August 18, 1988 and September 16, 1988. The Environmental Assessment Form and NOP both indicated that the proposed project would involve the expansion of an existing ten-acre aggregate quarry over a 337-acre site, and the installation of a crushing, screening and washing plant, a concrete batch plant and an asphalt plant on-site. The NOP also stated that the proposed site would be reclaimed upon completion of mining. The Surface Mining Permit Application filed by CalMat estimated an overall mine life of at least 50 years. A copy of the NOP and Environmental Assessment Form is included in Appendix 5.1 of this document, along with the responses received by the County during the review period.

This EIR will be used by the County of Riverside in its deliberations for the granting of a use permit for the project. It is also intended to provide environmental information to the general public and to several responsible agencies who also have permitting authority for the project. These agencies, and their responsibilities relative to the proposed project, are listed on Table 1-1.

TABLE 1-1
AGENCIES RESPONSIBLE FOR ISSUING PERMITS
FOR THE CORONA QUARRY

AGENCY	*RESPONSIBILITY*
California Department of Fish and Game	"1603" Stream or Lake Alteration Permit
U.S. Army Corps of Engineers	Section 404 Clean Water Act Permit
South Coast Air Quality Control Board	Emissions Discharge Permit
Riverside County Health Department, Environmental Health Division	Underground Storage Tank Operating Permit Hazardous Materials Handler Permit

In addition to the responsible agencies identified above, other public agencies are expected to have an interest in the proposed project's environmental effects. These include, but are not necessarily limited to:

U.S. Fish and Wildlife Service (USFWS)
California Air Resources Board
California Highway Patrol
California Department of Conservation, Division of Mines and Geology
California Department of Transportation (CalTrans), District 8
California Local Agency Formation Commission (LAFCO)
California Resources Agency
Riverside County Building and Safety Department
Riverside County Fire Department
Riverside County Flood Control and Water Conservation District
Riverside County Office of the Road Commissioner
Riverside County Surveyor
City of Corona (which includes the project site within its Sphere of Influence)
Western Municipal Water District

1.2 EIR ISSUES MATRIX

Table 1-2 summarizes the proposed project's anticipated environmental impacts, mitigation measures and those responsible for implementing such measures, and the significance of potential impacts following the implementation of mitigation measures.

TABLE 1-2
ENVIRONMENTAL ISSUES MATRIX

HYDROLOGY/DRAINAGE

Setting	Impacts	Mitigation
The subject site is situated along Temescal Wash, a small ephemeral stream, which serves as the principal drainage channel for most of the surrounding area. A portion of the site lies within the 100-year floodplain. Topography on-site exceeds 50%, but the natural materials are not easily eroded. Groundwater levels on-site vary from year to year, from 10 feet to 30 feet below adjacent ground surface.	No adverse impacts on drainage patterns or streamflow are anticipated as a result of the project. Some erosion into Temescal Wash will occur. Groundwater will not be impacted by the project. Diversion of water for use in processing on-site will not exceed amounts entitled to proponent by surface/ groundwater rights. Water quality will not be impacted.	Improvement of access road will require analysis and design to properly maintain channel characteristics in Temescal Wash. Sediment traps shall be located in flatter areas outside floodplain to capture displaced sediments. No mitigation is necessary to protect groundwater and surface water levels/ quality.

NOISE/VIBRATION

Setting	Impacts	Mitigation
Existing noise levels in the general vicinity of the project site are attributable to traffic and train noise sources. Noise levels reach a maximum of 80 decibels.	The nearest residential land uses will not be adversely impacted by the noise generated on-site. Combined mining and processing plant noise levels at the nearest residence will not exceed 55 decibels. Associated off-site traffic noises will stay below 75 decibels (within the "Normally Acceptable" classification.) Vibration resulting from blasting will not be significant.	Although it does not appear that their will be significant noise/ vibration impacts, a performance condition shall be imposed allowing mining to proceed as long as specific noise levels are not exceeded. Initial blasting shall be limited to 2,000 pounds of explosive per 8 ms blast increment. Seismic monitoring will determine if this limit can be raised.

AIR QUALITY

Setting

Local air quality is a factor of regional wind patterns and urban pollutants generated in the greater Los Angeles/ Orange County area. Ozone is the primary concern in the region. Particulate concentrations occasionally exceed Federal standards.

Impacts

The most significant air quality impacts produced by the project will be particulates (dust) emitted by various processes, especially blasting, mining, crushing and screening. The majority of these will be large particles which will fall back onto the site, or in the undeveloped land to the east. Lesser amounts of carbon monoxide, hydrocarbons, nitrogen oxides and sulfur oxides will be emitted, primarily from off-site vehicular traffic.

Mitigation

Compliance will SCAQMD Rules and Regulations will result in mitigation of impacts. During rare daytime winds from the west, additional mitigation shall include wetting of grading activities and delaying of blasting.

VEGETATION/WILDLIFE

Setting

The majority of the subject site is covered by a mixture of non-native grassland and coastal sage scrub. Riparian vegetation is found in the major drainages. A very high quality riparian environment exists on the south boundary of the site. A portion of the site is inhabited by one endangered wildlife species: the Stephens kangaroo rat. Two sensitive wildlife species have been observed on-site: the golden eagle and the California black-tailed gnatcatcher.

Impacts

The project will result in the elimination of nearly all the grassland/coastal sage habitat, with resulting impact on the sensitive and endangered animal species. Lesser impacts will be effected on the riparian habitats. The project will not encroach on the Stephens kangaroo rat habitat area, and no impact on this species is expected.

Mitigation

The riparian area on the southwest end of the project site shall be preserved. The pit plan shall be designed to avoid the Stephens kangaroo rat habitat. The project proponent will comply with the requirements of the Stephens kangaroo rat protection ordinance, currently being drafted.

CULTURAL/HISTORICAL/ PREHISTORICAL

Setting

No prehistoric sites have been recorded within on mile of the subject site. No resources were located during field observations. The history of the immediate area is primarily one of mining. The geological units located on-site have a low probability of yielding paleontological specimens.

Impacts

Since no cultural resources have been observed on-site, no impact will be produced by the project.

Mitigation

The proponent shall be required to file a written plan for the protection of cultural resources should any be unearthed or detected during mining.

VISUAL AESTHETICS

Setting

The project is located on a dominant local topographical feature, though the site is obscured on one day out of three by poor air quality. It is visible from residential, commercial, and industrial land uses, as well as two freeways. The hillsides in the area are already visually impacted by mining and related processing.

Impacts

The greatest visual impact would be precipitated by topographical changes. Elevational changes over the next 75 years would be very significant. The most obvious visual impact will be on residential properties to the west and north, and views from the I-15 freeway. The processing plant will cause visual impacts to a lesser degree.

Mitigation

Complete mitigation of visual topographical impacts is not possible. During reclamation, equipment and other mining-related features shall be removed, and mined terraces modified to produce as topographical faces which appear as natural as possible. A permanent, self-perpetuating vegetative ecosystem shall be established to closely approximate pre-mining conditions.

TRAFFIC

Setting

Magnolia Avenue is operating at near its design capacity in the vicinity of the project site. The remainder of the roadways in the area are operating at "B" Level of Service or better.

Impacts

Heavy trucks make up the majority of traffic which will be generated by the site. When fully operational, the on-site activities will generate approximately 1,750 daily vehicle trips. When the projected vehicle trips are added to existing traffic conditions, the 2-lane segment of Magnolia Avenue west of Cajalco Street will exceed its design capacity.

Mitigation

Magnolia Avenue in the vicinity of Cajalco Street shall be improved to a 4-lane divided roadway when production at Corona Quarry exceeds 2,350,000 tons/year. The intersection of Magnolia Avenue and Cajalco Street shall be periodically monitored by the County to determine if a traffic signal is warranted. The project proponent shall contribute to the upgrading of Magnolia in direct proportion to the percentage of traffic generated by the project. Use of the existing railroad spur may be used to partially mitigate traffic impacts.

PUBLIC SAFETY

Setting

The existing site consists predominantly of slopes facing westward. The adjacent properties are all in industrial or open space land uses. The closest housing development is 1/2 mile away.

Impacts

Ground vibration and air blast caused by the blasting activities on-site will be barely discernible at the nearest residence. No toxic substances or gasses will cause hazards either on- or off-site.

Mitigation

All laws, regulations, and standards pertaining to the use of explosives shall be observed. Weather data shall be monitored and blasting shall not occur during temperature inversions or wind conditions which might reflect air blast towards housing developments near the site. Initial blast designs shall not exceed 2,000 pounds/8 ms. Seismic monitoring shall be used to determine safe limits subsequently. Blasting plans shall include specific requirements to protect on-site employees and off-site residents.

FIRE HAZARDS

Setting

The subject site is located within an area designated by the County of Riverside as a Hazardous Fire Area.

Impacts

During the first phase of mining the subject site would be subject to possible damage by fire. However, following the first phase of the project the site will be cleared and fire danger will be reduced over existing conditions.

Mitigation

All flammable materials shall be handled an stored in a safety-conscious manner. Blasting shall be accomplished by only trained personnel. Spark arrestors shall be used on equipment used in vegetated areas.

2.0

PROJECT DESCRIPTION

2.0
PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The Corona Quarry site is located near the Temescal Wash approximately one mile south and east of the City of Corona in Riverside County. As shown on Figures 1 and 2, the project site lies south of Magnolia Avenue and east of Cajalco Road. The site encompasses 336.92 acres within an unincorporated portion of western Riverside County. It is also within the City of Corona's Sphere of Influence. The property is bordered on the west by the Temescal Wash and the Atkinson, Topeka and Santa Fe Railroad right-of-way. Directly to the north of the property is the All-American Asphalt mining and processing facility. Fontana Paving (Boral) and Minnesota Mining and Manufacturing (3M) also have mining and processing facilities directly to the south. The remainder of the surrounding properties are currently vacant open space.

The proposed quarry is located within a geological resource area known as the Orange County-Temescal Valley Production-Consumption Region.[1] (See Figure 3.) This designation identifies significant geological deposits available to meet the greater Los Angeles area's future needs for construction-quality aggregate. More specifically, the proposed Corona Quarry is located within Sector Q of the state-identified mining resource zone, which encompasses the Temescal Wash area located southeast of the City of Corona, from Magnolia Avenue to Cajalco Road near the community of El Cerrito. (See Figure 4.) The State's Mining and Geology Board has classified this site as a Mining Resource Zone-2 (MRZ-2), indicating that significant mineral deposits are present.

The first quarrying operations in the Corona area began in 1888. Temescal Wash has been the location of aggregate mining since the 1920s. Minnesota Mining and Manufacturing (3M) has operated a permitted multibench, side-hill, drill-and-blast quarry less than one mile south of the proposed site since 1947. This operation extracts dacite porphyry for processing into roofing granules and industrial filler. L.S. Hawley is currently operating a permitted multibench, side-hill, drill-and-blast quarry on a portion of the project site. This riprap quarry has been in operation since the 1940s and was permitted in 1956. Permits for this operation include M3-269 and Reclamation Plan 117.

2.2 PROJECT OBJECTIVES

The Corona Quarry project proposes to achieve the goals and objectives stated below:

1. <u>Utilize a regionally significant mineral resource to supply construction aggregates and related products for the Inland Empire region of Southern California, and beyond, as needed.</u> The Mining Resources Zone (MRZ) classification system was developed by the California Mining and Geology Board to focus on urban and urbanizing areas for the purpose of conserving valuable mineral resources and protecting future supplies of these resources from the development of incompatible land uses. Production-Consumption (P-C) regions were established in areas where resources are extracted and processed (production), and where they are marketed (consumption). The proximity of these areas is critical in the aggregate industry due to the small profit margin generated by the product and the extremely high transportation costs related to delivery.

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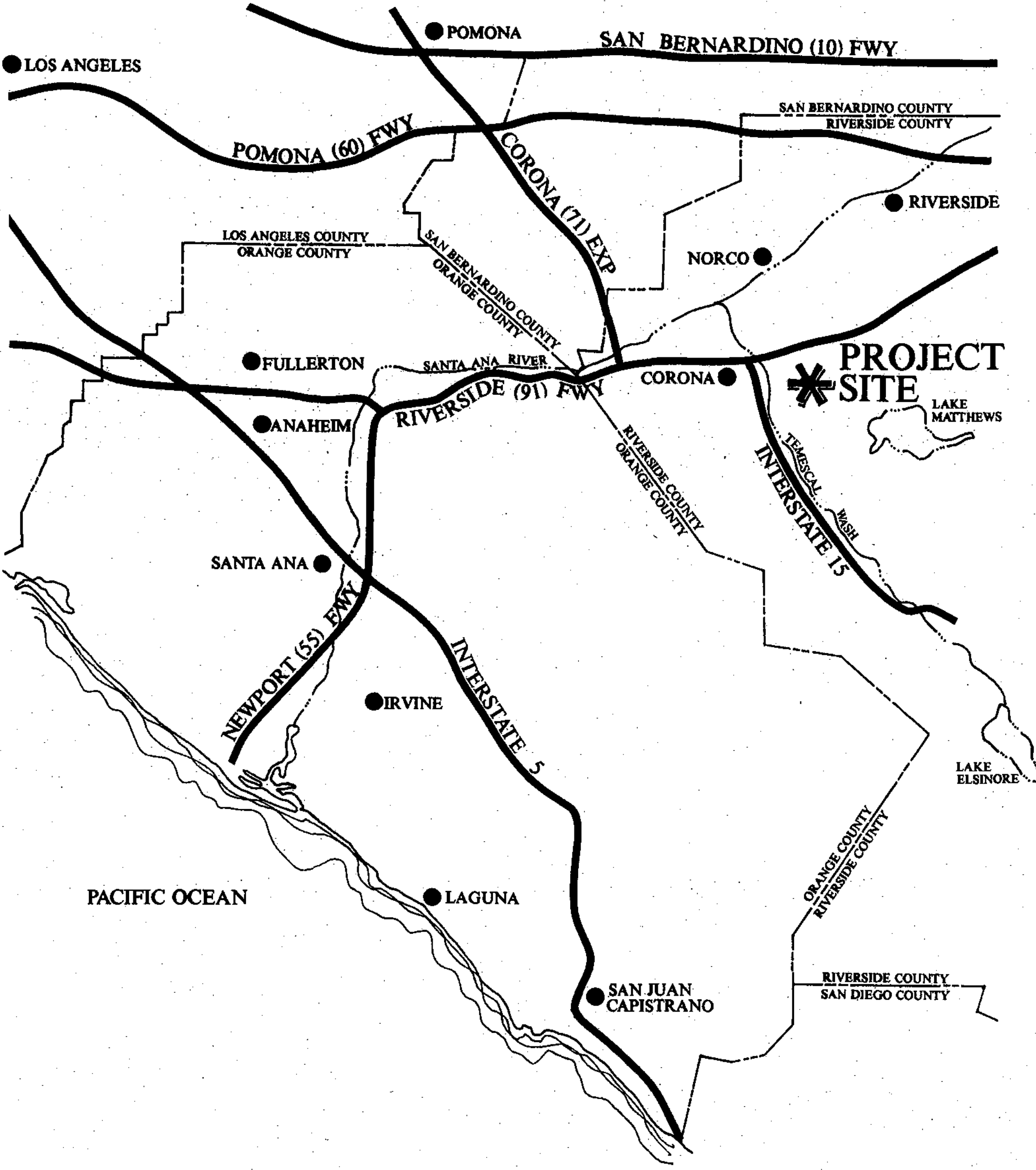
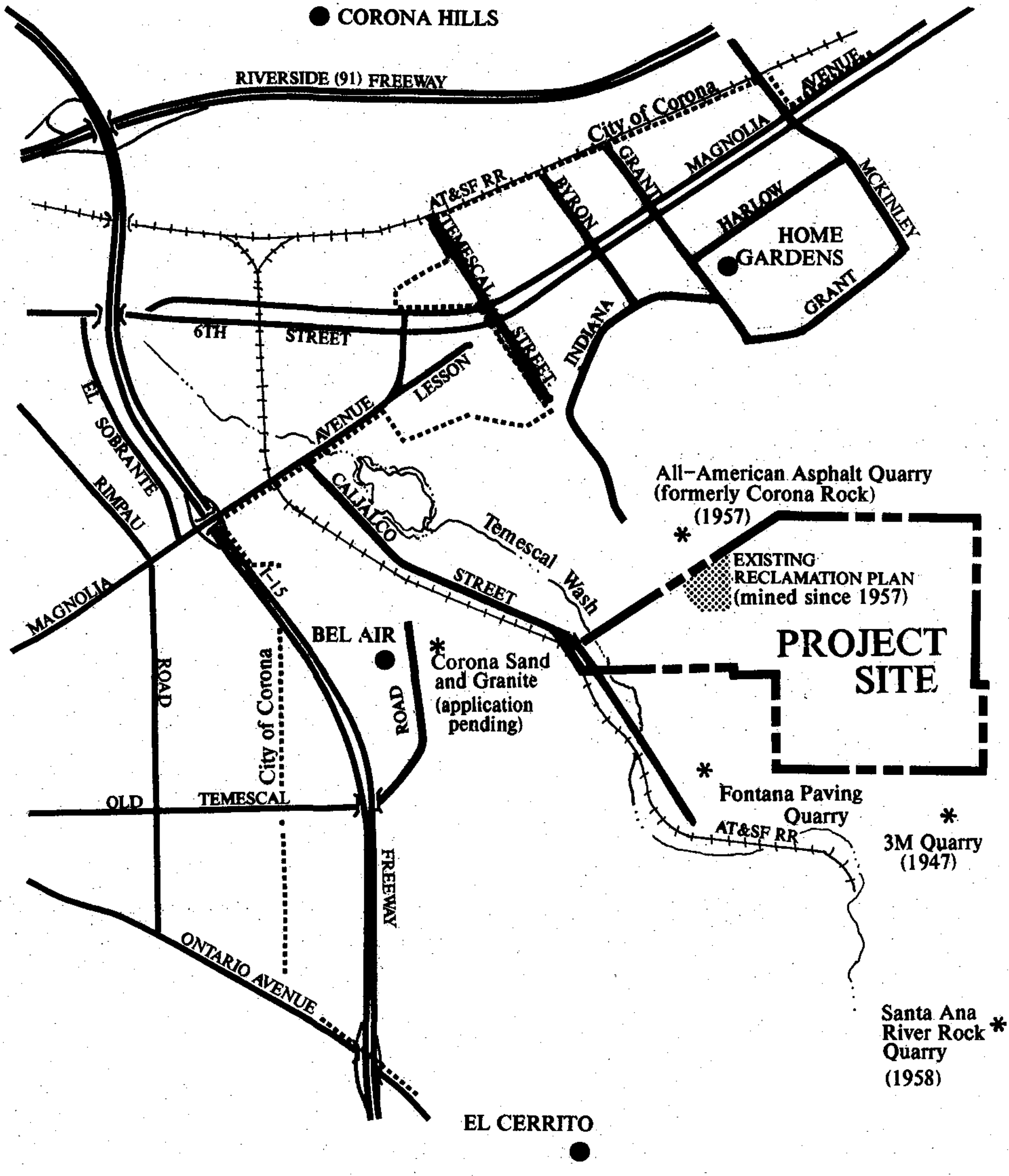
[1]California Department of Conservation, Mining and Geology Board, SMARA EIR No. 3, (SCH #82042314), *Designation of Regionally Significant Construction Aggregate Resource Areas in the Orange County-Temescal Valley and San Gabriel Valley Production-Consumption Regions,* December 1982, p. 3.



REGIONAL VICINITY MAP

CORONA QUARRY
CALMAT CO.

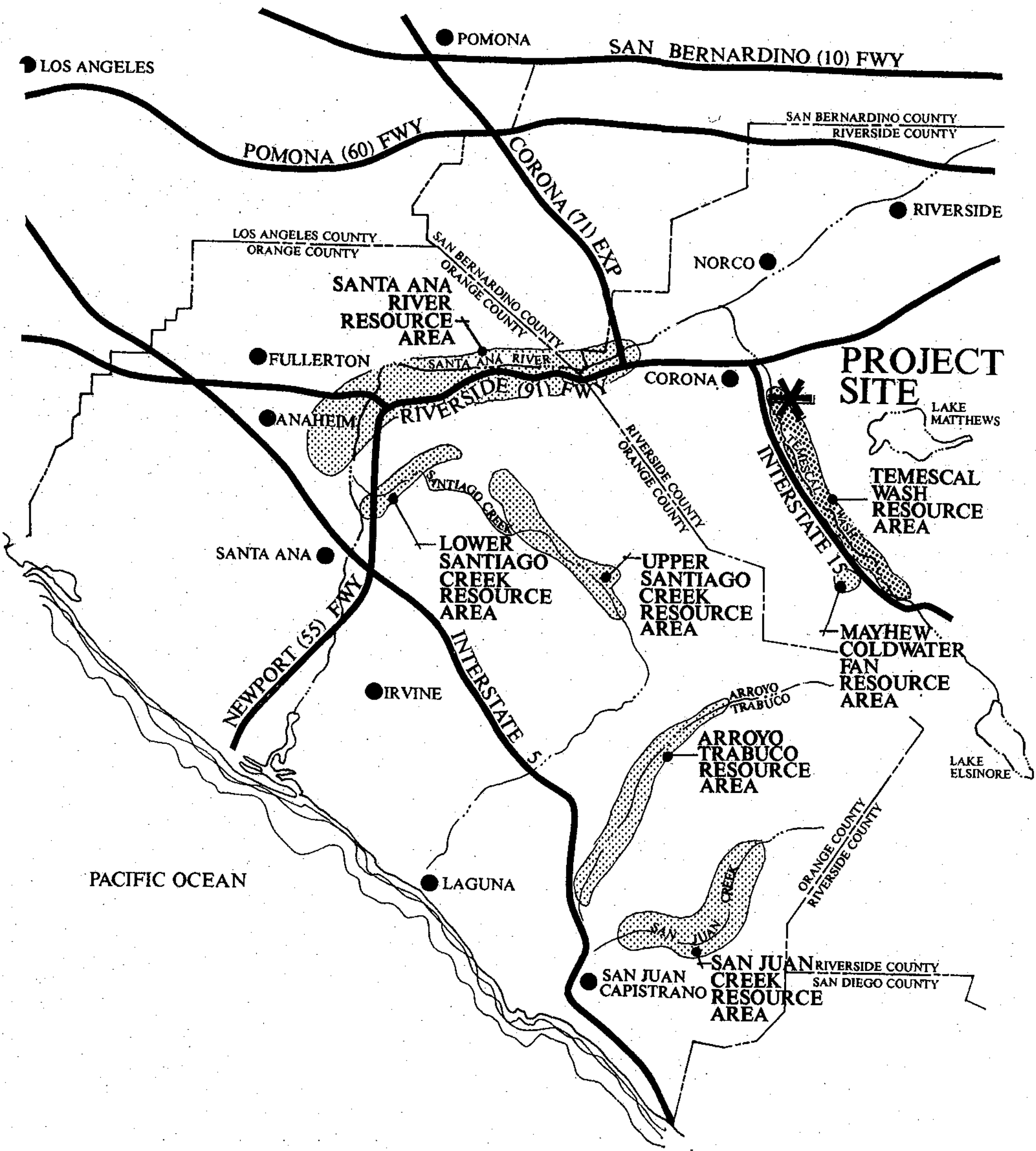
FIGURE 1



LOCAL VICINITY MAP

CORONA QUARRY
CALMAT CO.

FIGURE 2

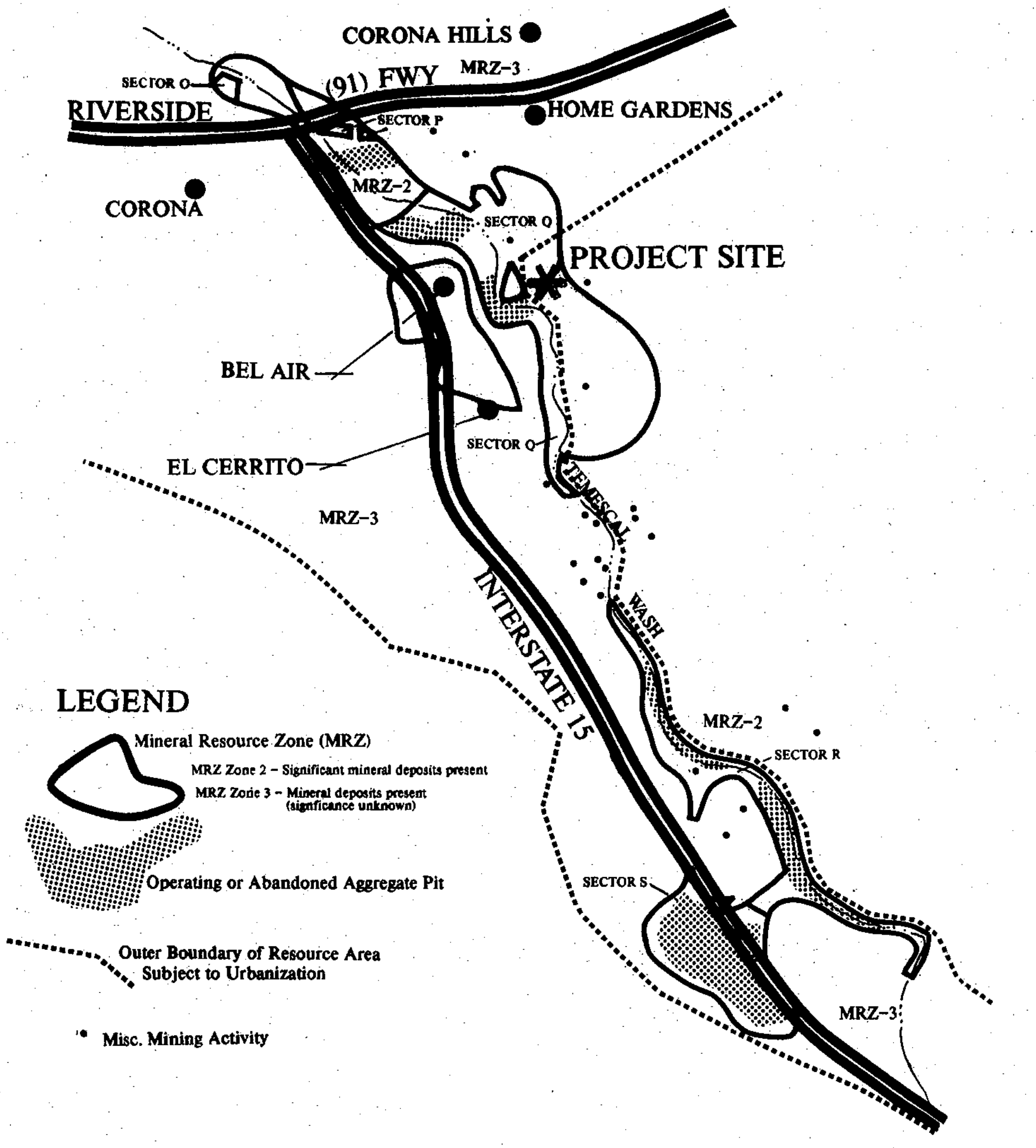


ORANGE COUNTY – TEMESCAL VALLEY
AGGREGATE PRODUCTION – CONSUMPTION REGION

CORONA QUARRY
CALMAT CO.

SOURCE OF INFORMATION:
SMARA EIR #3

FIGURE 3



TEMESCAL WASH AGGREGATE RESOURCE AREA

CORONA QUARRY
CALMAT CO.

Source of Information:
SMARA EIR #3

FIGURE 4

A major objective for establishing these classifications was to forecast the mineral resource demands for the P-C regions. Using a variety of data, the California Mining and Geology Board projected the 50-year demand for each region. The data included regional population projections, historic aggregate production records, and per capita consumption rates. Following this analysis, the Board concluded that the projected 50-year demand for the Orange County-Temescal Valley P-C Region is 850 million tons of aggregate resources. This figure could easily double in the event of massive reconstruction following a natural disaster such as an earthquake. Current reserves within permitted aggregate mines total approximately 257 million tons. These reserves are likely to be depleted in about two decades from the writing of this Environmental Impact Report. The Orange County-Temescal Valley P-C Region is estimated to contain additional reserves of approximately 1,130 million tons which are not permitted at this time. Without the creation of substantial numbers of new extraction facilities, a great amount of construction aggregates will need to be imported at significant cost and environmental consequence. This will also place a strain on other P-C regions in San Bernardino, San Diego and Los Angeles Counties. The adjacent P-C regions will experience similar demands upon their resources and it is unlikely that they will be able to supply the rapidly growing Orange County-Temescal Valley area should this region not be available for extraction, while meeting their own local needs.[2] Further, it should be recognized that the end cost of aggregate is highly dependent upon delivery distance. The cost to the user is doubled with every 50 miles aggregate is transported.[3] The ability to locally produce aggregate resources is a key to minimizing construction costs in this rapidly growing area.

2. Provide reclaimed land, following mining, which is suitable for a variety of land uses. By the time mining is complete, mining properties are often ideally located for conversion to a variety of second productive uses. The mined land is frequently more adaptable to these uses than the original topography. Such is the case with the Corona Quarry site. The current topographical conditions would not easily accommodate development, except for the relatively level western edge of the project site. The remainder of the site would require the grading of solid rock to provide contours compatible with any use except open space. However, after mining the Corona Quarry, much of the site topography will be suitable for many uses. The following list suggests some possible post-mining land uses, along with examples of successful reclamation implementation for each:

o	High-tech Industrial Park	White Rock Development Sacramento
o	Recreational Facility	Holme-Pierrepont,England
o	Research and Development Facility	Corby New Town, England
o	Experimental Agriculture Facility	Bush Farm, England
o	Water Storage Reservoir	Anaheim Lake, California
o	High-amenity Housing	Coldspring, Washington, D.C.
o	"Land Art" (earth sculpture)	Great Salt Lake, Utah
o	Mining Museum	Beamish Open Air Museum England
o	Theme Park	Thorpe Park London, England
o	Botanical Gardens	Butchart Gardens Victoria, Canada
o	Horticultural Show Site	Hamm, West Germany
o	Horse-racing Track	Heerlen, Holland

[2]California Department of Conservation, Mining and Geology Board, December 1982, pp. 166-172.

[3]Southern California Rock Products and Ready-Mixed Concrete Associations, *Building Cities .... Producing Jobs: The Gravel Lands - A Natural Resource,* undated brochure.

It is difficult to project and forecast the specific manners in which land will be used 75 years in the future. Reclamation of the Corona Quarry site will provide a suitable surface for various post-mining uses such as residential, commercial, industrial, public service or recreational/open space. The revegetated benches and slopes will have secondary uses limited to open space, greenbelts, and/or agriculture. None of these uses will be specifically precluded as a result of the mining activity. The reclaimed site will be free of debris, equipment and other hazards which would prevent appropriate land uses.

The reclamation plan for this site does not specifically detail post-mining land use. Rather suitable conditions will be provided for the above land uses. The site will be stabilized and landscaped in preparation for these uses. The basic topography which will remain after mining is completed will be bowl-shaped. If the mining progresses below the water level the reservoir left behind can serve as a focus for water-related activities. It the pit floor is above the water table, the flat bottom can provide a great deal of space for a long list of land uses. The sides of the pit can provide topographical screening of the on-site operations, or serve as vantage points for observation of activities occurring below.

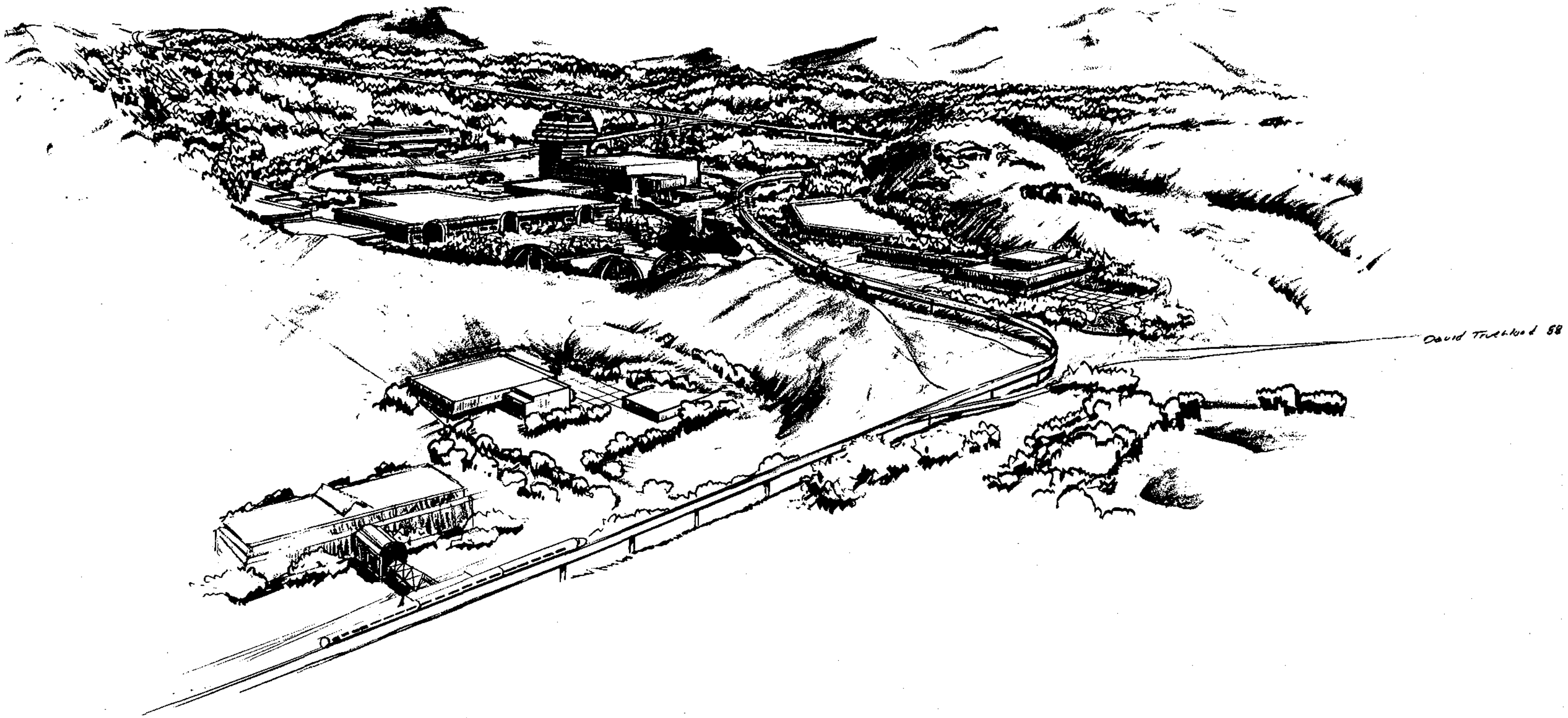
3. <u>Minimize environmental impacts.</u> While by the very nature the proposed operations at Corona Quarry many significant environmental alterations will be precipitated, it is a goal of the project to limit these as must as possible. The location and design of the processing plant and its access roads will seek to protect the existing riparian habitat at the west side and southwest corner of the site, which are important wildlife corridors and watering places. Mining and natural habitats can, and often do coexist, readily. There are many examples, including some CalMat sites, of sensitive species residing within short distances of active mining and processing operations. One such case is CalMat's San Juan Creek site. Mining of this property has actually enhanced the riparian habitat. Reclamation of this site has begun, with the goal of providing a self-sustaining riparian ecosystem.

   Mining has relatively low impact on portions of property which are not being worked. Evidence of such peaceful co-existence can be seen on property adjacent to the Corona Quarry site, where the Federally-listed endangered species, the Stephens kangaroo rat, resides within a few hundred feet of hardrock mining which uses explosives.

   In addition, mining operations such as the proposed project are technically temporary. Although mining is planned to continue for several decades at Corona Quarry, eventually the site will be reclaimed and made available for another land use. Other kinds of development permanently obliterate all natural environments from a site. After mining, many sand and gravel sites are returned to a natural state, often providing better wildlife habitat than existed before.

   Figures 5, 6, and 7 are artist's conceptions of what the reclaimed Corona Quarry site could look like with various types of land uses.

POTENTIAL RECLAMATION



STUDY 1 – URBAN DEVELOPMENT

CORONA QUARRY

CALMAT CO.

FIGURE 5

POTENTIAL
RECLAMATION

STUDY 2 –
RECREATION

CORONA QUARRY
CALMAT CO.

FIGURE 6

POTENTIAL RECLAMATION

STUDY 3 – INDUSTRIAL

CORONA QUARRY

CALMAT CO.

4. Minimize land use conflicts. Figure 8 illustrates the Corona Quarry site in relation to existing land uses, zoning designations and general plan land uses. The majority of the site and many of the surrounding properties are zoned as Mineral Resource and Related Manufacturing (M-R-A) or Manufacturing - Heavy (M-H). This indicates that Riverside County has recognized the suitability of this property for the proposed use, and the importance of this resource area to the county and the region. This relationship between resource management and land use planning is very important, as noted by the California Department of Conservation, Division of Mines and Geology:

   > *The rapid growth of many California communities, particularly during the past two decades has served to emphasize the continuing importance of mineral resource conservation as a land use issue. To support the maintenance of our existing community structure, as well as provide for its continued growth, adequate supplies of a variety of mineral commodities must be available at a reasonable cost. Yet, urban expansion itself has been a major cause of a decline in the availability of many important minerals. In many areas, for example, pressure from competing land uses has severely reduced or completely eliminated access to available mineral resources such as sand and gravel deposits. The loss of these deposits has occurred because land use planning decisions have often been made with little, if any, knowledge of the location and importance of these resources.*[4]

5. Guarantee the safety of the public, mine workers, and customers. The fact that blasting will occur as part of the proposed Corona Quarry operation is likely to generate a great deal of concern among regulatory agencies and the public at large. Such a reaction is to be expected. However, recent technological advancements, both in explosive materials and blasting techniques, have gone far in increasing the safety of the on-site technicians and off-site neighbors. The proposed Corona Quarry project will take advantage of the latest innovations to safeguard operations to the fullest extent possible. (See Appendix 5.12, Blasting Report.)

2.3 PROJECT DESCRIPTION

The proposed Corona Quarry project is a mining and processing facility which will operate on property leased by CalMat Co. (This property is owned by L.S. Hawley, Pacific Industrial Properties, and Bruce A. Hohn.) The proposed mine will take advantage of a rich mineral resource, designated by both the State of California[5] and Riverside County[6] as a regionally significant mineral deposit. The operation will produce a wide spectrum of construction aggregates, ranging from fine sands to riprap. These products are used as the basic ingredient in concrete for construction of homes, public and private buildings, dams, bridges, highways and other structures. The materials removed from the Corona Quarry may also be utilized in asphalt and other building products such as concrete blocks and paving stones.

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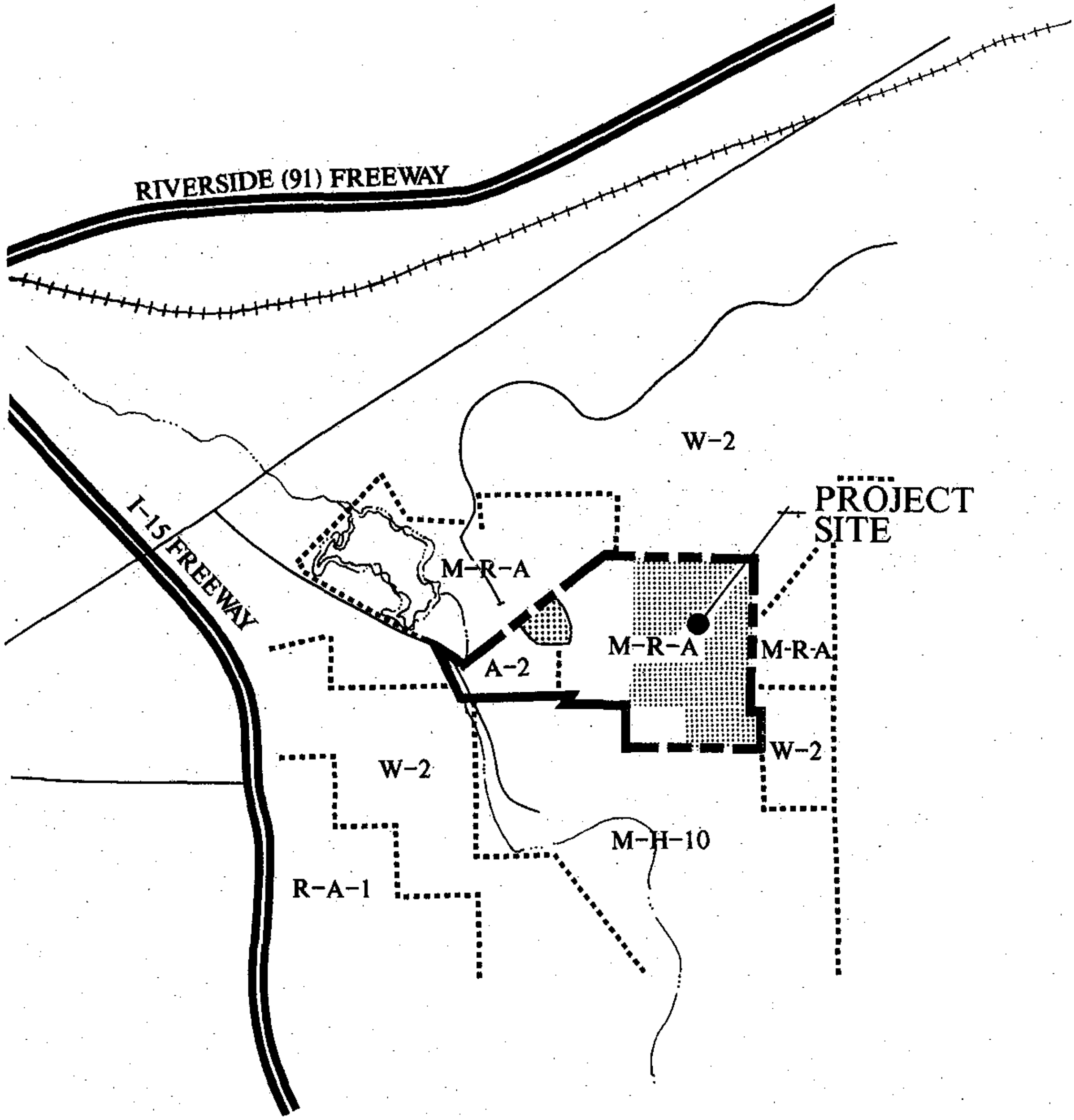
[4]California Department of Conservation, Division of Mines and Geology, Special Report 143, Part 7, *Mineral Land Classification of Greater Los Angeles,* 1983.

[5]California Department of Conservation, Mining and Geology Board, December 1982, p. 122.

[6]County of Riverside, *Comprehensive General Plan,* Second Edition, December 1986, p. 399.



LEGEND

ZONING

A–2	Light Agriculture with Poultry
M–H–10	Manufacturing – Heavy (10 acre min.)
M–R–A	Mineral Resources and Related Manufacturing
R–A–1	One–Family Dwellings – Mountain Resort
W–2	Controlled Development

GENERAL PLAN

Mineral Resources (entire site)
Mountainous (entire site)
Hazardous Fire Hazard (entire site)
Stephens Kangaroo Rat Range & Habitat

JURISDICTIONAL CONTEXT

CORONA QUARRY

CALMAT CO.

FIGURE 8

The Corona Quarry is a "hardrock" deposit. In other words, the resource is located on hillsides, as opposed to the traditional in-stream or floodplain aggregate resource areas. The resource in this area is well-defined and relatively easy to quarry. This type of deposit will require blasting to sufficiently fracture the material for removal. It will be necessary to further loosen and remove the material with loaders, shovels and/or backhoes. Haul trucks and/or conveyor belts will be used to transport the aggregate from the excavation site to the plant site. Figure 9, Mining - Processing Flow Diagram, illustrates the proposed mining and processing operation.

The geologic material to be mined at the Corona Quarry site will consist of the following:

Temescal quartz latite porphyry
Corona hornblende granodiorite porphyry
Cajalco quartz monzonite
Home Gardens quartz monzonite porphyry
Micropegmatite granite

At the plant site the transported aggregate material is processed to make it commercially acceptable. This processing involves the following steps:

1. The material is first separated into the desired sizes. This separation is accomplished by a series of vibrating screens. Various stages of crushing may be used to reduce the aggregate to the necessary sizes. A jaw crusher is used for the primary reduction for material over three inches in diameter. Jaw and cone crushers further reduce the rock to less than one inch, manufacture 1/4- or 3/8-inch "pea gravel," sand, and other finer products.

2. "Wet" processing is used to separate the sand fraction of aggregates and to wash fines (material too small to be used in construction products) from aggregates used in concrete. Cyclone-type separators are employed to recover fine sands. Hydraulic settling tanks may be used to further separate the sand into various sizes. Spiral classifiers (sand screws) are used to remove the water from the sand.

3. Once processed, the material is stockpiled for later sale or delivery, incorporated into concrete or asphalt, or transported off-site.[7]

One of the most critical factors affecting the price of aggregate to the customer is the cost of transportation from the processing plant to the site where it will be used. Transportation costs are based mainly upon the number of miles the material must be hauled and the time required to load, haul, and unload the material. Since aggregate products are by nature a high volume commodity with low unit costs, it is extremely important to locate the production facilities near the consumption markets for economic viability.

Mining of the Corona Quarry site is proposed to occur in two phases. The first phase, as illustrated in Figure 10, could last up to ten years. During this time about 7,000,000 tons of aggregate material will be removed and processed in order to provide a relatively level site near the entrance to the quarry on which to locate a permanent processing plant. To accomplish this, a temporary portable processing plant will be located at the western end of the site. Phase Two will begin once the permanent processing plant has been installed. (See Figure 11.)

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[7]Goldman, H.B., *Aggregates from "Fossils": Rock Products,* Vol. 65, No. 11, 1962, p. 68.

MINING–PROCESSING FLOW DIAGRAM

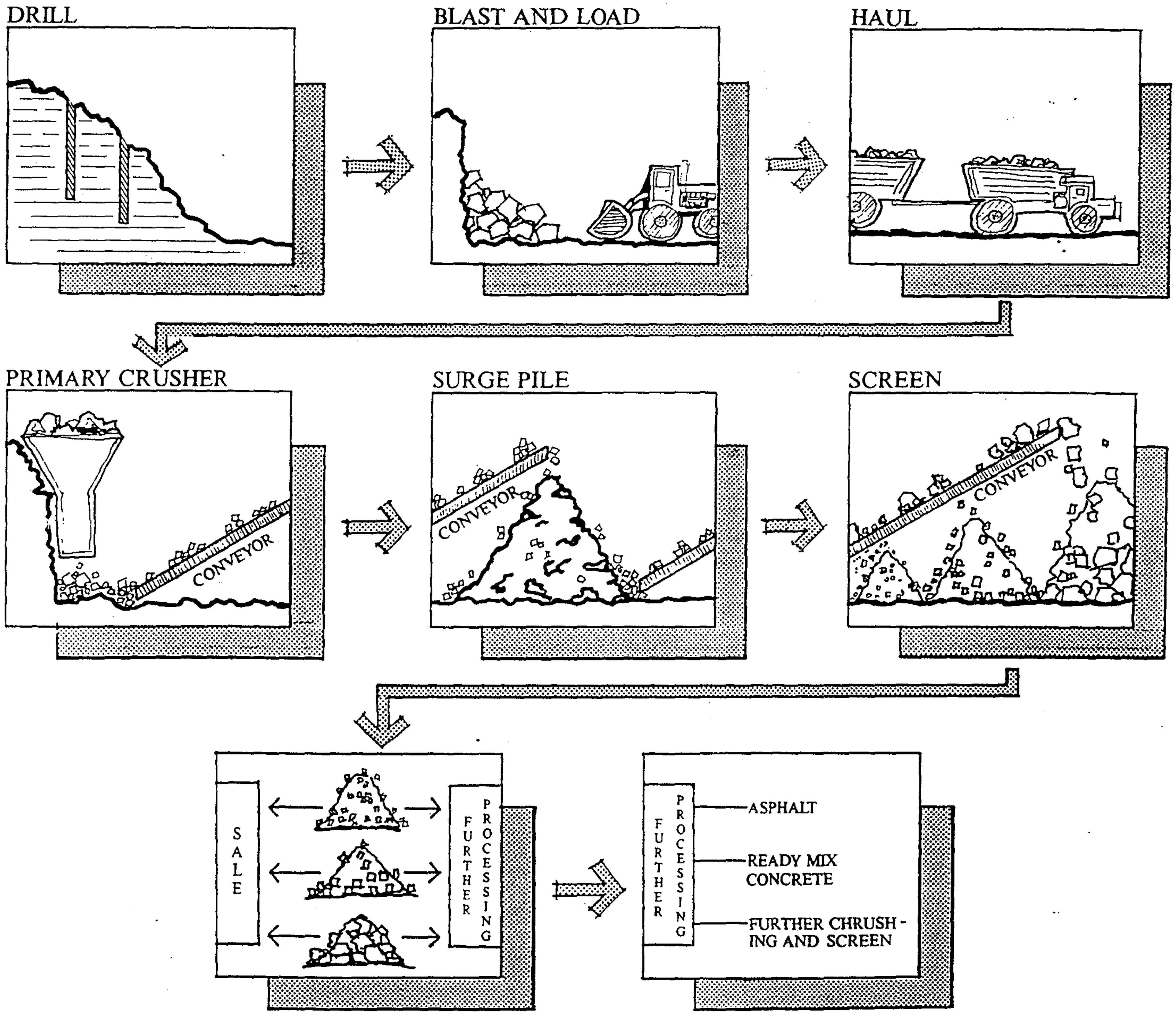

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FIGURE 9

MINING PLAN – PHASE 1

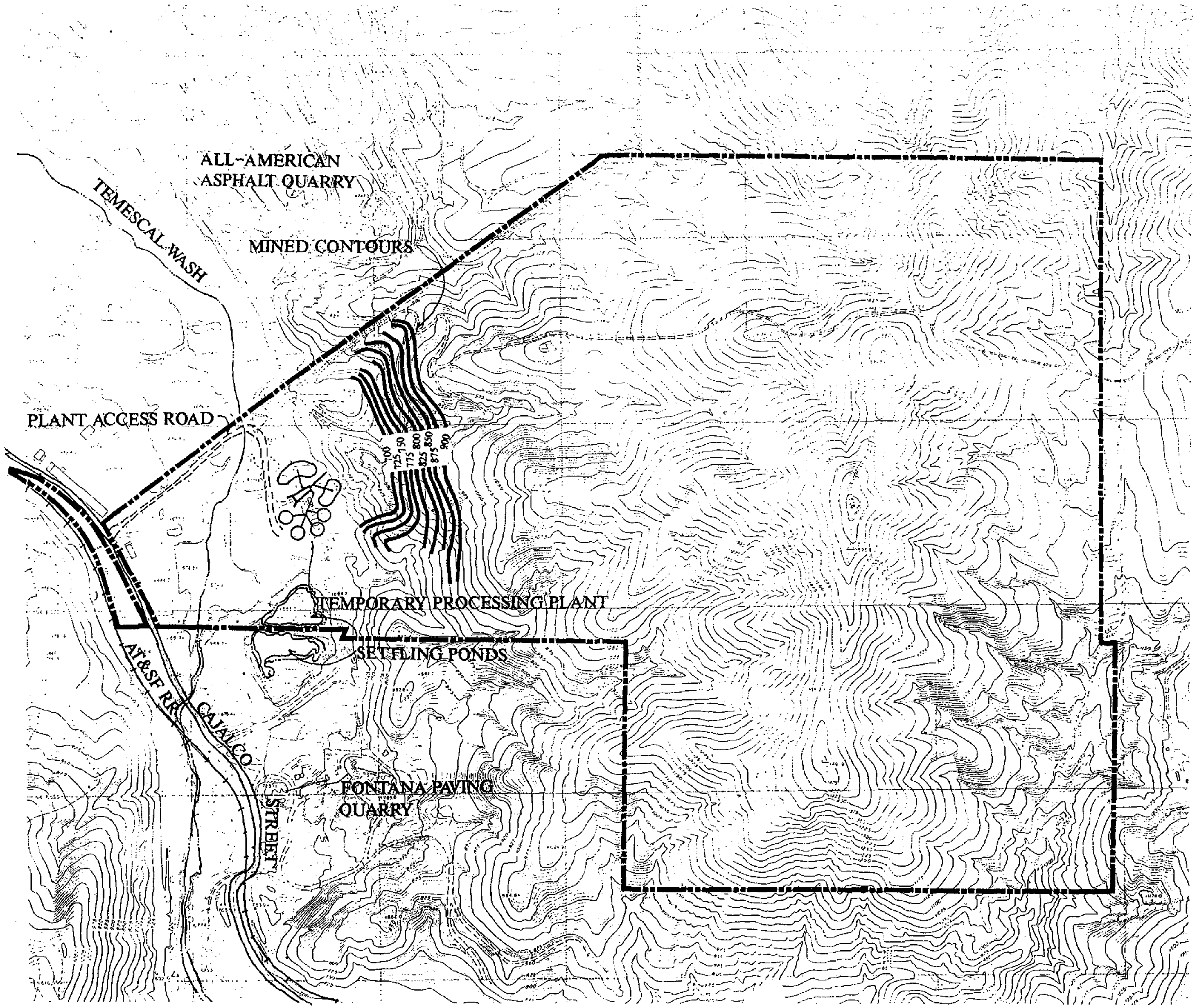

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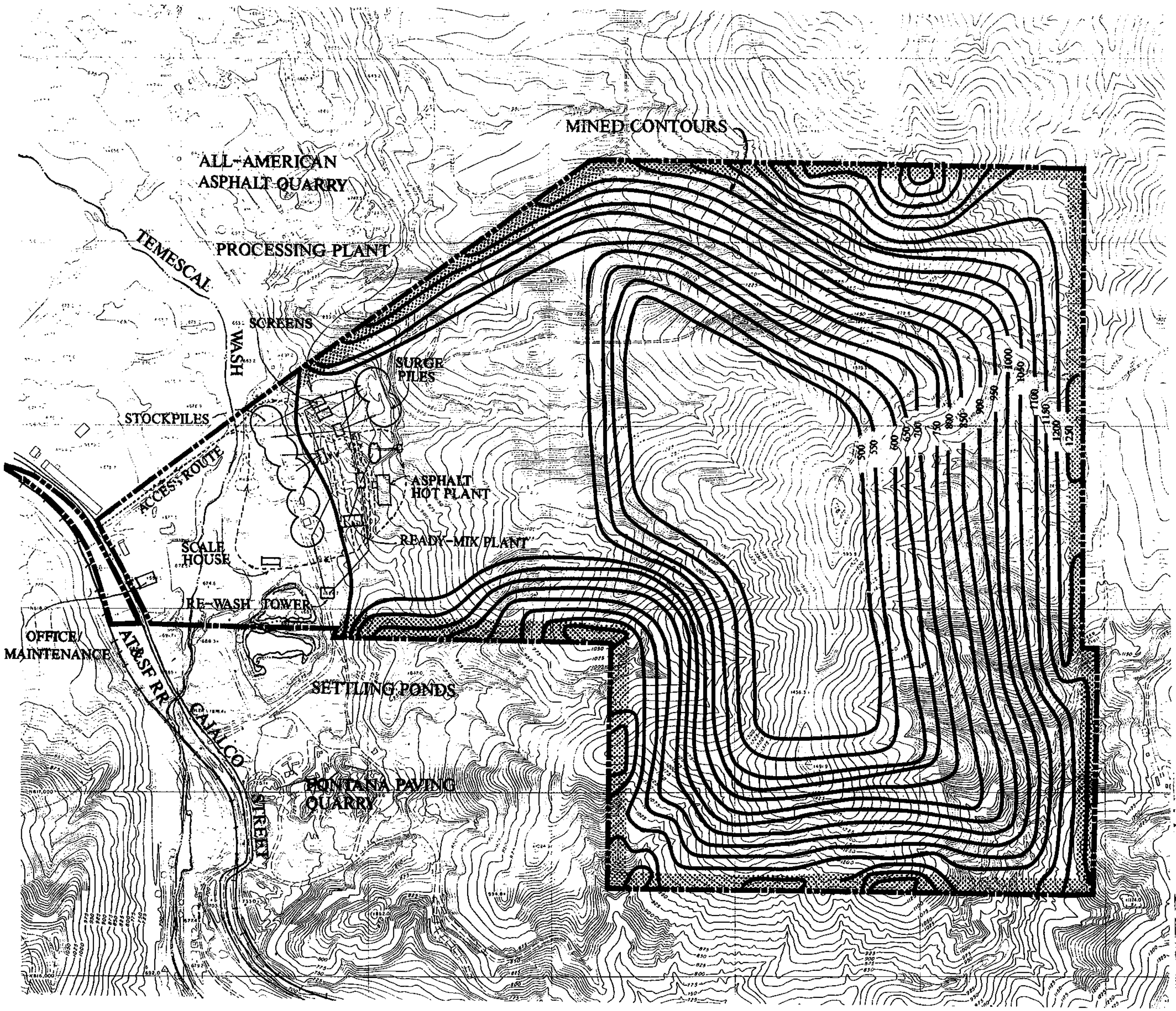
FIGURE 10

MINING PLAN – PHASE 2



LEGEND

SETBACK

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FEET

FIGURE 11

Mining will occur in a basic top-to-bottom sequence. The mining will be a multibench, side hill, drill and blast operation, similar to the current quarrying on-site and on the identified adjacent operations. Final benches will be established at approximately 25-foot intervals. Processing, including crushing and sorting, will also occur on the property. (See Figure 9, 10, and 11.) A concrete batch plant, asphalt plant, and other related aggregate product facilities will also be sited.

Of the 336.92 acres encompassing the Corona Quarry site, approximately 260 acres will be mined. The remainder of the property will include setbacks, processing areas, storage sites, road ways, and undisturbed open space unsuitable for mining. The Corona Quarry will be mined to the lowest elevation of approximately 500 feet Mean Sea Level (MSL). (See Figure 12.)

As noted above, mining will be accomplished by drill and blast, load, haul and dump methods. In normal situations, blasted rock will be loaded onto off-road dump trucks by large rubber-tired loaders. The dump trucks will then transport the rock via haul roads to the primary crusher. The primary crusher will reduce the quarry run material to less than eight inches in size. Conveyor belts will carry the product rock from the primary crusher to a surge pile near the processing plant. The processing plan will utilize crushers and vibrating screens to size the materials into specification aggregates for sale. These sales may take the form of on-site direct sales or transfers to on-site aggregate users such as concrete batch plants and asphalt plants.

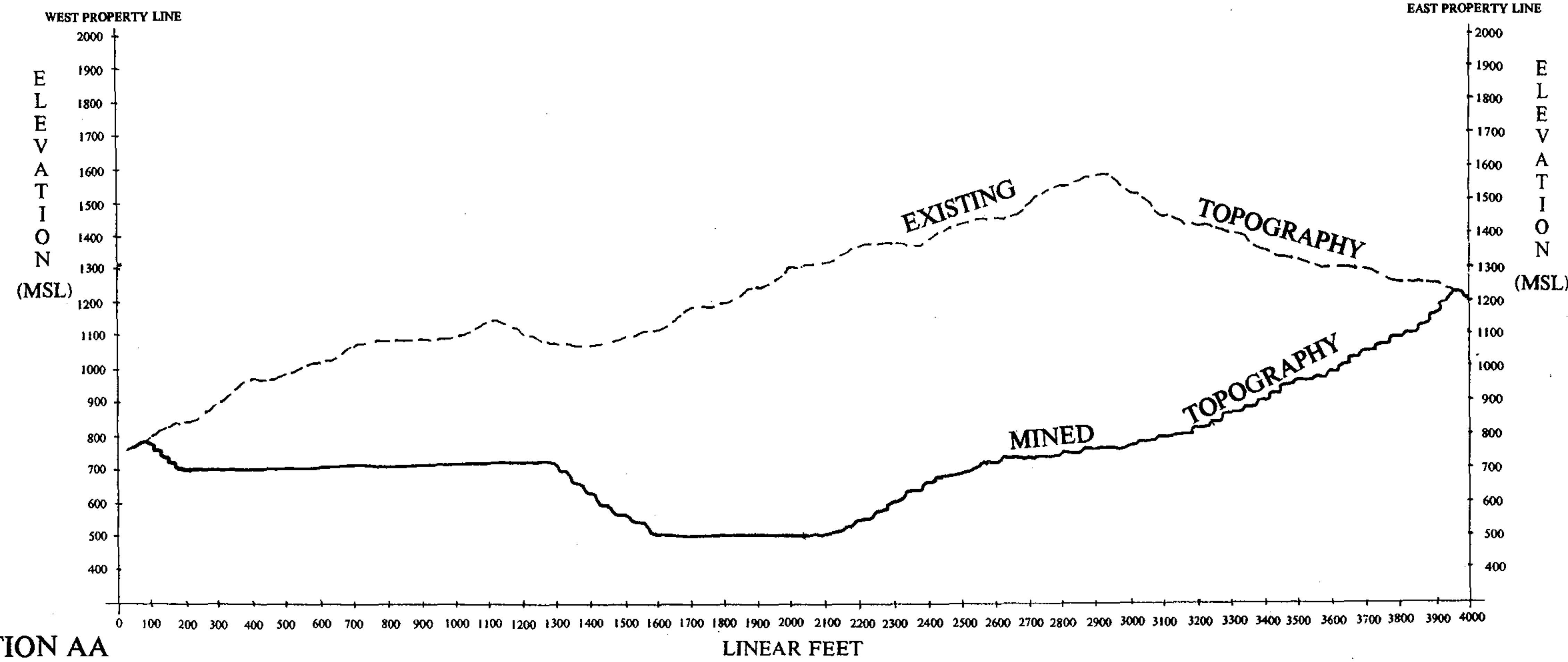
The Corona Quarry is expected to begin the expanded operations within 90 days of the issuance of a Surface Mining Permit by the County of Riverside. Mining will continue until the depletion of the aggregate resource. It is difficult to determine exact dates for this activity since product depletion is a factor of resource quality and market characteristics. It is anticipated that the mine will remain productive for a period of time in excess of 75 years, based on projections by CalMat Co. The schedule for mining and processing will be a function of prevailing market conditions. It is estimated that over 400 million tons of rock will be extracted and processed over the life of the mine. The anticipated annual yield is summarized in Table 2-1.

TABLE 2-1
ESTIMATED AGGREGATE PRODUCTION

Year	*Annual Production*
1-2	300,000 - 750,000 tons
3-4	750,000 - 1,000,000 tons
5-9	1,000,000 - 2,000,000 tons
10-year life of mine	2,000,000 - 5,000,000 tons

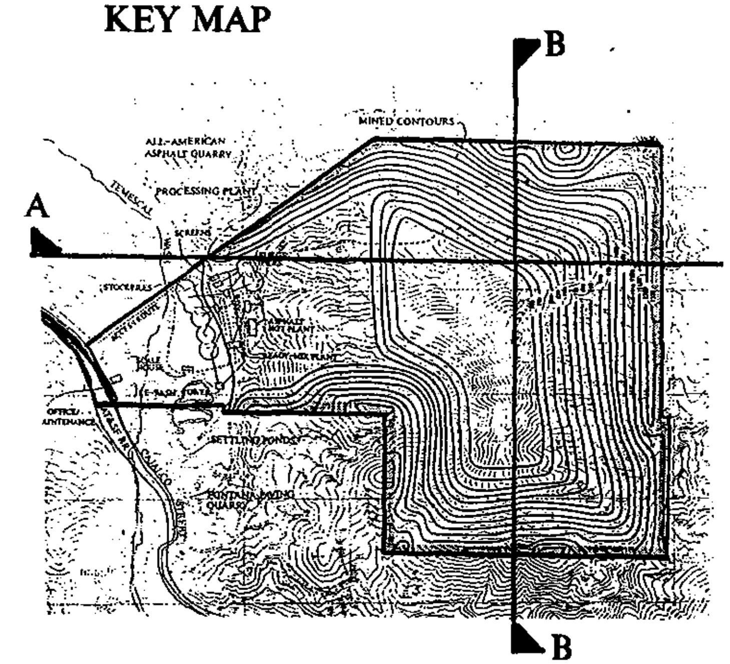
Long-range forecasts indicate that the regional demand for construction aggregates will be increasing far into the mid-21st century. Therefore, demand may drive production of construction aggregates on the site to exceed 5,000,000 tons per year.

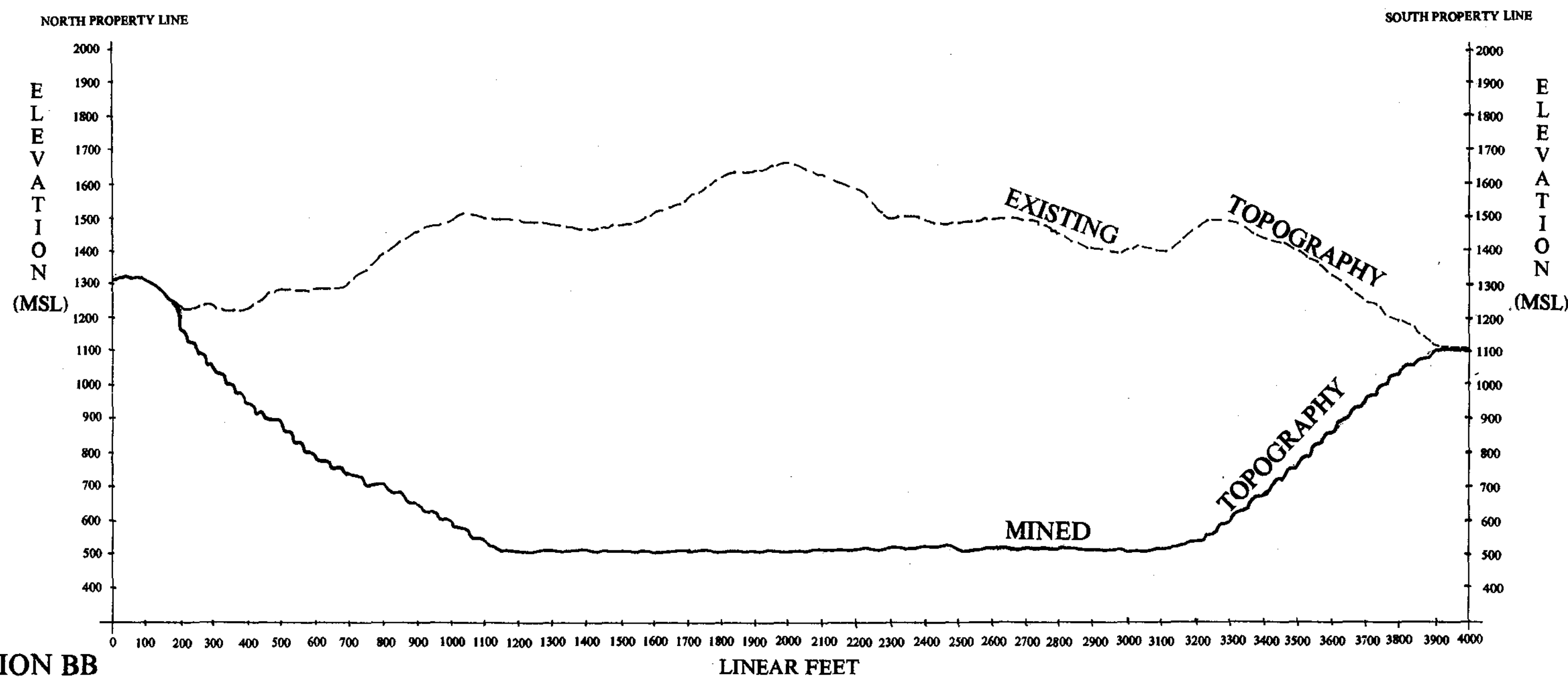
MINING CROSS-SECTIONS



SECTION AA

KEY MAP





SECTION BB

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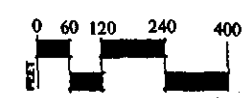

FIGURE 12

The aggregate mining operation will be relatively free of mining wastes based on the site composition. Only two types of excess materials are predicted to occur. First, there will be excess overburden soils and rock types which cannot be processed into saleable aggregates. Second, natural fines are washed from the aggregates used in concrete products. These products -- fines, overburden and unsuitable rock types -- can often be successfully marketed by the mine operator. However, the demand for these products cannot be guaranteed. If sales of the fines produced in this operation are not realized, the materials will be incorporated back into the site during reclamation. The total anticipated excess material for the site is estimated to be approximately 3,500,000 tons. It is anticipated that this material will not be found distributed evenly throughout the site, so annual volumes could be highly variable.

The project proponent anticipates the possibility of using the existing railroad tracks for distribution of products at some time in the future. Conveyors would be used to transport materials over Cajalco Street to the small piece of property leased by CalMat and located along the railroad siding. Such a potential use would not begin until Phase II. The feasibility and logistics of such a process will be investigated during Phase II of the project.

The proposed project includes the reclamation of the site following completion of mining activities. Some reclamation may occur concurrently with aggregate extraction and processing. This would consist of deposition of the excess materials mentioned above as fill on-site and the stabilization and landscaping of reclaimed side slopes.

3.0

ENVIRONMENTAL SETTING
POTENTIAL IMPACTS
MITIGATION MEASURES

3.0
ENVIRONMENTAL SETTING
POTENTIAL IMPACTS
MITIGATION MEASURES

3.1 HYDROLOGY AND DRAINAGE

3.1.1 Environmental Setting

Drainage and Flooding: The Corona Quarry site is situated along the eastern side of the Temescal Wash, a small ephemeral stream which serves as the principal drainage channel for most of the surrounding area. This channel begins at Lake Elsinore southeast of the site, and extends northerly to its confluence with the Santa Ana River near Prado Dam. There have been only minor flood control improvements made to the channel, primarily streambed realignments and channelization along Temescal Wash, but not on the portion that crosses the Corona Quarry site. The on-going mining operations along the wash have modified the original stream profile over the past half-century.

Although a portion of the subject property is located within the wash itself, no significant alteration of streamflow patterns has occurred. Approximately 30 percent of the alluvial deposit along Temescal Wash within the property is located within the 100-year floodplain. Historically, sand and gravel mining operators along Temescal Wash have attempted to divert a portion of its flow around their deep, closed excavations, in order to permit dry mining above groundwater levels. However, the wash, and all existing culverts and roads, including an upstream railroad bridge, would be totally inundated during a 100-year flood event.

The 100-year floodplain boundary, based upon a 100-year discharge estimated at 24,000 cubic feet per second, is shown on Figure 13, Hydrology Map. This boundary was calculated at the request of the Riverside County Flood Control and Water Conservation District using HEC-2 methodology, Federal Emergency Management Agency data, and U.S. Army Corp of Engineers research.[8] The 100-year floodplain depicted on Figure 10 does not exactly coincide with previous floodplain boundaries appearing on the latest published Flood Insurance Rate Map (FIRM), which was based on an approximate analysis using topography which is at substantial variance with existing landforms.

An existing low-flow culvert crosses the Temescal Wash near the northern property boundary. This culvert could be expected to be damaged or destroyed by floods of 20-year magnitude or greater.

The remainder of the site is fairly steep and generally slopes in a westerly direction towards Temescal Wash. Runoff is directed into one of two arroyos which carry flow to the wash. These water courses are located parallel to and near the northern and southern property lines.

Erosion: Local topography on the Corona Quarry site has slopes which range from practically flat to in excess of 50 percent. Erosion is considered to be high on slopes that are from 15 to 50 percent. However, the natural materials occurring on site are not characteristically easily eroded, except on the steepest portions of the site. Natural materials are currently located on the surface, with little or no covering of soil. No major slope failures have been identified on-site.

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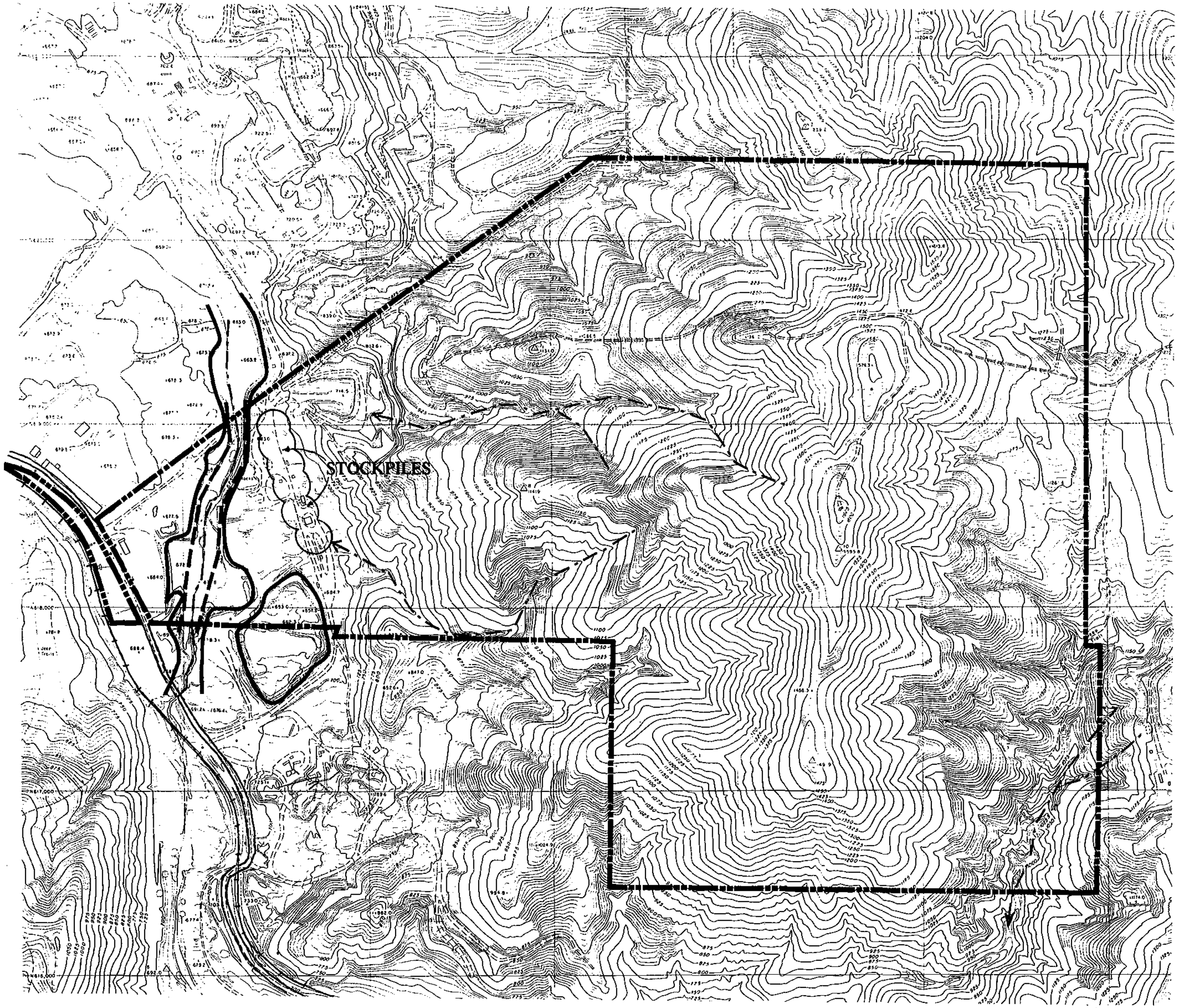
[8] R.H. Born, P.E.

HYDROLOGY MAP



LEGEND

EXISTING WATER COURSES

100-YEAR FLOODWAY

100-YEAR FLOODPLAIN

SOURCE OF INFORMATION:
ROBERT H. BORN, CONSULTING ENGINEER

CORONA QUARRY

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0 100 200 400 600

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FIGURE 13

Groundwater: Groundwater levels in the vicinity of the subject property can be most easily observed by the fluctuating surface level of water in the excavation at the southern property boundary. Groundwater levels vary from season to season and from month to month, and are mostly a function of recharge from runoff along the Temescal Wash. Groundwater levels are expected to vary from 10 feet to approximately 30 feet below the adjacent ground surface. These levels would be a function of dry year to wet year conditions.

Surface and Subsurface Water Quality: The streamflows in the Temescal Wash are typically ephemeral, although urban irrigation runoff does provide some non-seasonal flow. Flows are also seasonal according to the winter runoff and water levels in Lake Elsinore. For example, in the early 1980s, which are considered to have been wet years, Lake Elsinore overflowed into Temescal Wash, increasing its water level. However, in the years since 1983, the lake level dropped and flows in Temescal Wash have reflected normal runoff patterns of average to dry years.

The remainder of the site is only subject to natural localized runoff. The qualities of this stormwater runoff is not considered hazardous or detrimental to the environment.

3.1.2 Potential Impacts

Drainage and Flooding: During quarry operations it is anticipated that no improvements will be made within the floodway and floodplain of Temescal Wash, except for the upgrading of the existing access road. No adverse impacts are anticipated on drainage patterns as a result of the proposed quarry operations.

Culverts will be installed within the plant site and on access roads for local drainage control. Bedrock materials within the rock quarry area are stable and will not require erosion control treatment.

Stockpiles will be located outside of the floodplain and will not impact flows during rainfall events. (See Figure 10 for stockpile location.)

Channelization will be used to direct runoff from the two arroyos into the Temescal Wash, and around the proposed processing plants. To assist with reducing the amount of sediment transported into the wash, sediment traps are proposed on either side of the processing plant before the arroyos discharge into Temescal Wash.

Erosion: Since natural drainage patterns typically flow towards the west and into Temescal Wash, it is anticipated that some erosion into the wash will occur. As mining progresses, this erosion potential will be lessened as silts and sediments are captured within the open pit. Also, the processing plants will tend to act as a buffer in capturing sediments from unmined portions of the site.

Groundwater: The mining operations proposed for the Corona Quarry site will not be detrimental to the quality or quantity of groundwater. Eventually, mining may reach elevation below groundwater levels. However, mining is not normally detrimental to groundwater quality, as can be evidenced by many such activities active in reservoirs and groundwater recharge basins.

Surface and Subsurface Water Quality: Although a portion of the subject property is located within the Temescal Wash, no significant alteration of streamflow patterns is anticipated. During the proposed quarry operations, adequate steps will be taken to maintain the existing positive drainage pattern of that portion of the site located within the floodplain. Berming and sediment traps will be used to prevent runoff water from carrying excessive sediments into the wash, and from altering the streamflow patterns. There will be no adverse drainage effects on adjacent property as a result of the proposed quarry operations.

Water will only be used in processing on-site to wash those aggregate to be used in concrete. All other aggregates are produced without utilizing water, except as necessary for dust control. The average use is expected to be approximately 1,500 gallons per minute while washing aggregates. This water will be recycled. The anticipated total water loss from aggregate absorption and evaporation is estimated to range between 10,000 and 40,000 gallons per operating day during the first few years of operation. Later production increases may raise the quantity of water consumed.

The sources of operational water may include surface water, on-site wells, and municipal water, if required. The most logical source from which to obtain water supplies for plant operations is within the extraction site itself, or from surface water diversions. It is not believed that diversions would exceed the amounts to which CalMat Co., the project proponent, is entitled under its existing surface water rights or its correlative groundwater rights granted through its lease agreements. Such diversions would not fall under the jurisdiction of the State Water Resources Control Board, except for the requirement to file notices.

Disposal of wastewater will not be necessary, as all production water will be recycled. This recycled water will contain natural soils and fines washed from the aggregates. These materials, which are not toxic, will be settled out in a pond and the water reused. It is anticipated that the large pond located at the southwest corner of the project will be enlarged and used for settling. Other ponds may need to be constructed for future increased production levels.

Some toxic substances will be used in the production of asphalt and concrete on-site, including diesel oil, lubricants, concrete admixtures, asphalt, and other items. However, no of these will be used or stored in such a way as to possibly contaminate surface water or groundwater. Additionally, no toxic disposal will occur on the site.

3.1.3 Mitigation Measures

Drainage and Flooding: The only improvement proposed within the Temescal Wash is the upgrading of the access road to the processing plant. As part of the design process of this road improvement, appropriate analysis shall be prepared to properly address hydraulic issues, maintain existing channel characteristics, while providing for an all-weather access way to and from the processing plant.

Erosion: To reduce the erosion potential from the site into Temescal Wash, sediment traps shall be located in the flatter areas outside the floodplain of Temescal Wash to capture sediments and silts which may be displaced. If necessary, similar sediment traps shall be located to capture silts or fines from the processing plant areas. Such measures would be expected to produce run-off from the site into the Temescal Wash with lower quantities of sediments and silts than would naturally occur.

Groundwater: No negative impacts upon groundwater are expected from the proposed operations, and mitigation measures are unnecessary and inappropriate.

Surface and Subsurface Water Quality: No detrimental impacts on surface or subsurface water quality are anticipated due to the proposed operation, and mitigation measures are unnecessary.

3.2 NOISE AND VIBRATION

Introduction

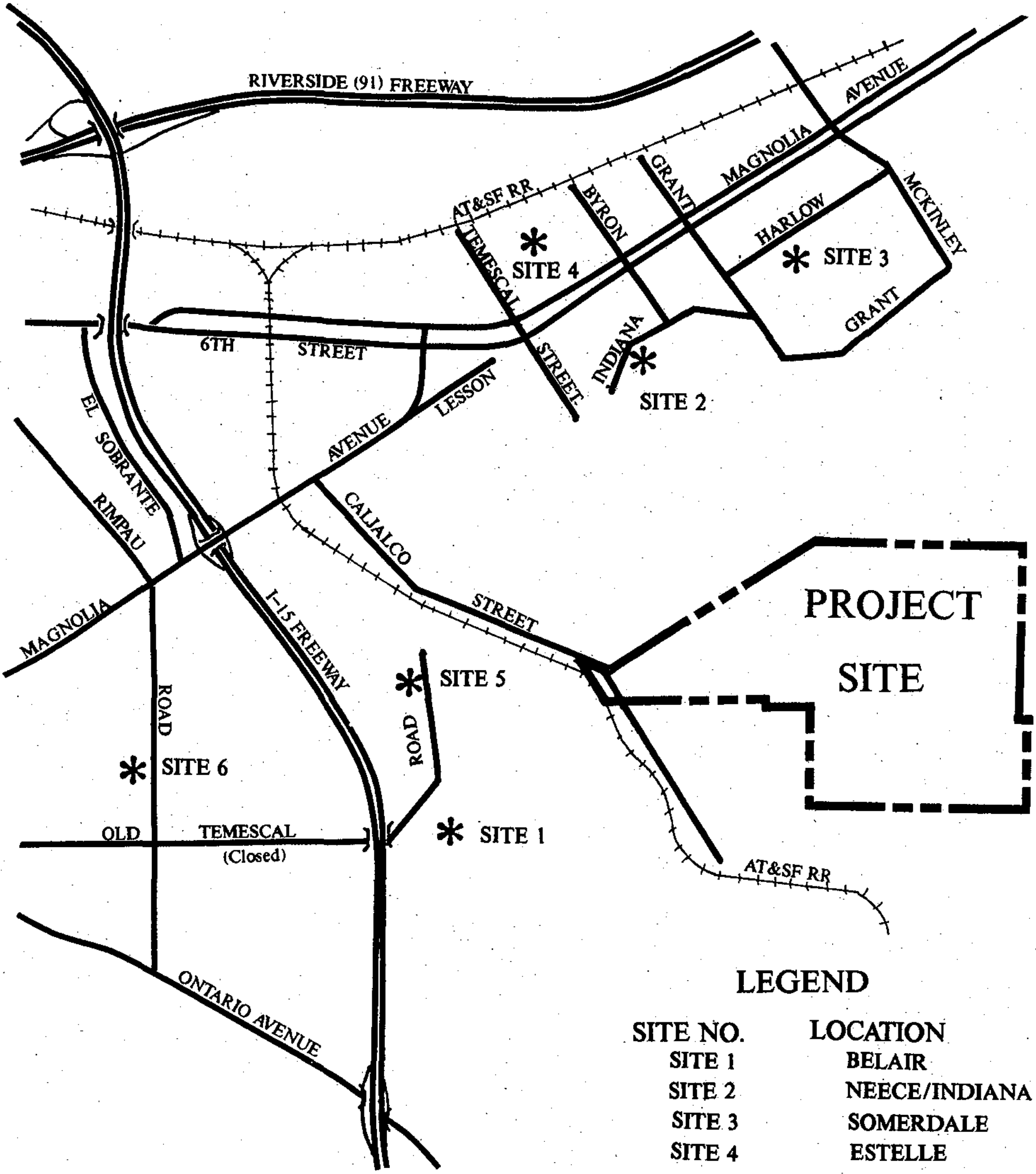
The following section is based on studies and calculations provided by Mestre Greve Associates. Their complete report is included in Appendix 5.6.

3.2.1 Environmental Setting

Existing noise levels were measured at six sites in the general vicinity of the proposed Corona Quarry. (See Figure 14.) The existing levels are attributable to traffic and train noise sources and existing mining operations in the area (All American, Fontana Paving, 3M). For all six of the sites monitored the loudest event was usually a car passing by on an adjacent roadway. Table 3-1 summarizes the findings of these measurements. Table 3-2 illustrates typical sound levels for comparison purposes.

TABLE 3-1
EXISTING NOISE LEVELS

Location	Average Noise Level	Maximum Noise Level
Daytime		
1	47 dB(A)	57 dB(A)
2	53 dB(A)	68 dB(A)
3	50 dB(A)	67 dB(A)
4	61 dB(A)	80 dB(A)
5	42 dB(A)	50 dB(A)
6	49 dB(A)	61 dB(A)
Nighttime		
2	43 dB(A)	52 dB(A)
5	44 dB(A)	55 dB(A)
6	39 dB(A)	46 dB(A)



LEGEND

SITE NO.	LOCATION
SITE 1	BELAIR
SITE 2	NEECE/INDIANA
SITE 3	SOMERDALE
SITE 4	ESTELLE
SITE 5	OLD TEMESCAL
SITE 6	RIMPAU

NOISE MONITORING LOCATIONS

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FIGURE 14

TABLE 3-2
TYPICAL SOUND LEVELS

dB(A)	Perception	Representative Outdoor Source	Representative Indoor Source
10	Threshold of Hearing		
40		Bird Calls Low Urban Ambient Noise	
50	Quiet	Large Transformers at 100 feet	
60		Air Conditioning Unit at 100 feet	Cash Register at 10 feet Electric Typewriter at 10 feet Dishwasher (rinse) at 10 feet Conversation
70	Moderately Loud	High Urban Ambient Noise Passenger Car (65 mph) at 25 feet Freeway at 50 feet	Living Room Music TV-Audio Vacuum Cleaner
80		Car Wash at 20 feet Prop Airplane at 1000 feet overhead Diesel Truck (40 mph) at 50 feet Diesel Train (45 mph) at 100 feet	Food Blender Garbage Disposal
90	Loud	Power Mower Motorcycle at 25 feet	Newspaper Press
100	Very Loud	Jet flyover at 1000 feet Bell J-2A Helicopter at 100 feet	
110		Turbo-fan Aircraft (take-off power)	Rock-n-Roll Band at 200 feet
130	Uncomfortable	Military Aircraft (take-off power with afterburner) at 50 feet	

3.2.2 Potential Impacts

Noise impacts for the proposed project will be generated by mining operations such as blasting, drilling, earth moving, aggregate processing, asphalt plant, concrete batch plant, as well as an increase in traffic on the roadways in the vicinity of the project.

Mining and Earth Moving: For the purposes of projecting potential impacts, previous measurements of typical mining equipment were used. This heavy equipment is believed to be the primary noise source for the proposed operations. This equipment consisted of:

- o Two D-8 Caterpillar Tractors
- o One Gallion Grader
- o One Terex TS-14 Scraper
- o Haul Trucks passing to and from mining site

Measurements were taken at approximately 250 and 500 feet from the site. The following are the expected noise levels to be generated by mining and earth moving (including back-up alarms and start-up alarms).

At 250 feet: Minimum level - 51.9 dB(A)
Maximum level - 72.1 dB(A)
Average level - 63.5 dB(A)

At 500 feet: Minimum level - 43.2 dB(A)
Maximum level - 66.3 dB(A)
Average level - 54.6 dB(A)

Rock Crushing and Aggregate Sizing: Noise generation estimates were based on the following equipment:

- o Two Standard Cone Crushers
- o One Short-Head Crusher
- o Belt Conveyors
- o Three 8' x 20' Triple-Deck Screens
- o One 980 Front-End Loader
- o Haul Trucks

The loudest noise projected from this processing will be due to truck engines. The crushers and other equipment are quieter than trucks. The expected noise generation is as follows:

At 160 feet: Maximum level - 87.0 dB(A)
Average level - 73.0 dB(A)

Drilling: Drilling operations involve running a diesel percussion-type drilling rig motor which will dig holes in preparation for blasting. For this project one drilling rig will operate 40 hours per week, all during daytime hours. The noise level will be relatively constant, with few peaks.

At 100 feet: Average level - 70.0 dB(A)

Blasting: The blasting proposed for the project will occur as often as once per day during maximum production. Blasting noise consists largely of low frequency noise components. The human ear is less sensitive to such noises than it is to high frequency noises. The blasting noise will be a relatively infrequent impulsive noise. The projected noise generation is as follows:

At 1,300 feet: Maximum level - 59 dB(A)

Asphalt Plant: Sand and crushed rock will be moved by conveyor belts from the dry aggregate plant to the asphalt plant, where it will be mixed with tar and other materials to make asphalt. The final product is loaded onto trucks by conveyor belts. The following is the expected noise generation from the asphalt plant:

At 200 feet:	Minimum level - 56.7 dB(A)
	Maximum level - 73.9 dB(A)
	Average level - 66.7 dB(A)

Concrete Batch Plant: Washed aggregate is moved by conveyor belts to the concrete batch plant, where it is mixed with water and cement and loaded onto concrete mixing trucks. The loudest noise expected in this operation will be from the truck engines, which run at very high speeds while being loaded. The expected noise levels are as follows:

At 135 feet:	Minimum level - 65.0 dB(A)
	Maximum level - 80.7 dB(A)
	Average level - 74.5 dB(A)

Combined Off-Site Noise Impacts: The area of most concern for off-site noise impacts from the proposed Corona Quarry is the residential area approximately 3,000 feet west of the site, indicated as Sites 1 and 5 on Figure 14. A few residences in this area will be in direct line-of-sight of the mining operations, but most are screened by intervening topography. Site 6, another residential area located approximately 7,000 feet west of the project will also be a receptor of on-site noises. Site 2, located approximately 4,000 feet north of the project boundary is shielded from most mining noises due to intervening topography.

All mining equipment will be located behind some form of a barrier (such as surge or stock piles, or intervening topography) or down inside a mining pit such that line-of-sight to homes west of the project will be broken. Such barriers result in a 5 dB(A) reduction of equipment noises which would be experienced without shielding. Initial phases of operations such as grading and blasting at higher elevations will not be shielded.

Table 3-3 summarizes the cumulative off-site noise levels from on-site sources.

The noise levels reveal that the nearest residential land uses will not be adversely impacted by the noise generated by the proposed mining operations during typical conditions. During such operations the noise from the mining operations will not be audible or will be barely audible in the residential areas. Riverside County does not have a noise ordinance that would apply to this project. The State of California Department of Health has developed a model noise ordinance to be used with noise source such as those to be generated on-site. This model noise ordinance establishes exterior noise standards and is designed to protect residential areas from noise sources on private properties. It is intended to control unnecessary, excessive and annoying sounds from stationary sources, but not for mobile noise sources such as heavy trucks traveling on public roadways, nor for motor vehicles on private property. The proposed Corona Quarry mining operation will be in compliance with the State's model noise ordinance. (Table 1 in Appendix 5.6 presents the noise standards contained in the model noise ordinance.)

The ambient (existing) noise levels in surrounding residential areas will be lower during the nighttime. Therefore, the sound generated by the proposed project operations are lilely to be more audible at night. The early morning activities such as truck loading may begin as early as 6:00 A.M. Nighttime operations may include processing, drilling and maintenance operations. Although the nighttime noise levels will likely be audible off-site, these levels will still be less than 5 dB(A) and will comply with the sample Model Noise Ordinance.

Off-Site Noise Impacts Due to Vibration: Potential impacts due to quarry blasting may include structural vibration in some of the homes surrounding the quarry site. Humans can perceive vibrations through two mechanisms: by their sense of touch, and by their whole body, such as when standing on a vibrating floor. Vibration frequencies below 1 Hz can be perceived by the whole body. Since most building elements have natural frequencies greater than 1 Hz, most vibrations will be perceived first through a sense of touch.

The release of energy from a blast of the type anticipated for the Corona Quarry operation results in two types of vibrations which will potentially be recognized at locations distant from the blast site: vibrations within the earth (Ground Vibrations), and noise vibrations (Air Blast). Both of these influence structural vibration.

TABLE 3-3
COMBINED MINING AND PROCESSING PLANT NOISE LEVEL AT NEAREST RESIDENTIAL AREAS

Site	Operation	Unshielded Maximum (dBA)	Unshielded Average (dBA)	Shielded Maximum (dBA)	Shielded Average (dBA)
2	Mining/Earth Moving	----	----	36	28
	Crushing/Sizing	----	----	47	33
	Drilling	----	----	----	----
	Blasting	----	----	42	----
	Asphalt Plant	----	----	36	29
	Concrete Batch Plant	----	----	39	33
	Total Site 2	**----**	**----**	**47**	**38**
5	Mining/Earth Moving	42	33	37	28
	Crushing/Sizing	53	39	48	34
	Drilling	----	----	----	27
	Blasting	43	----	43	----
	Asphalt Plant	42	35	37	30
	Concrete	45	39	40	34
	Total Site 5	**53**	**43**	**48**	**38**
6	Mining/Earth Moving	32	24	27	19
	Crushing/Sizing	43	29	38	24
	Drilling	----	22	----	17
	Blasting	38	----	38	----
	Asphalt Plant	32	25	27	20
	Concrete Plant	36	29	31	24
	Total Site 6	**43**	**34**	**38**	**29**

Ground vibrations occur when a blast is detonated and most of the energy produced travels through the rock, soil, etc., in the form of shock pressure waves and subsequent gas pressure. If the vibrations produces are of sufficient intensity, they may cause structural damage. However, as the vibrations move through the earth they expend energy and become weaker. The further away, the lower the vibration intensity.

The quantity of explosives detonated at any individual time affects the intensity of the vibrations. However, if explosive charges are detonated at intervals of 8/1000th of a second (8 ms) or more apart, they will not amplify one another. Therefore the critical factor is not the total quantity of explosives consumed in a "shot", but rather the quantity detonated at one instant. To the human ear a "shot" may sound as if everything was detonated simultaneously, when there may have actually been several small blasts at 8 ms or more apart.

Assuming a minimum distance of 2,640 feet from blast site to receptor, a limitation of approximately 2,000 pounds of explosives per 8 ms increment will be used to design blasts at Corona Quarry. Seismic monitoring from the vicinity of the nearest residences will occur during the first blasts to determine whether or not these limitations can be increased.

The second vibration effect occurring from blasting operations is Air Blast. Air Blast is the compressive wave that travels through the atmosphere. If this wave is audible it is called noise. But if the frequencies are below 20 Hz the vibration cannot be detected by the human ear and it is called concussion.

Air blast from an explosive "shot" can be produced by several mechanisms. Primarily it is the result of energy which has not been confined at the site and is allowed to escape into the atmosphere. It operations such as that anticipated for Corona Quarry it is impossible to prevent some energy release. Therefore, there will always be some air blast associated with the blasting.

Air waves are subject to certain natural conditions which may determine their direction and intensity. Temperature inversions may cause them to be refracted or bent away from their natural courses. Reflections off surfaces such as pit walls can occur. Wind can distort the wave pattern and warp the waves downwind or possibly towards the earth. These effects can be cumulative. A wall reflected, inversion bent, wind carried wave might produce a focal point at a considerable distance from the blast site.

Window panes are typically the weakest part of structures subject to air blast, and they are most likely to be the first indication of this effect. The principle effects are rattling of windows and noises which tend to startle people. Occasionally, ground vibrations and air blast arrive at a location at approximately the same time, magnifying the apparent intensity. Complaints may result from such an occurrence.

The proposed blast sequence at Corona Quarry will consist of 60,000 pounds of explosives to be detonated in 2,000 pounds/8 ms blast increment, in a maximum of 30 blast holes. The resulting vibration is estimated to be less than .005 g's (multiples of acceleration) at the nearest home. This vibration level is not considered to be significant for a once-a-day type event. The amount of vibration produced is less than can be noticed by the body. An individual may notice some small sense-of-touch vibration if touching a structure.

Potential Off-Site Traffic Noise Impacts: The proposed project will generate traffic, and as a result may alter noise levels in surrounding areas. Table 3-4 illustrates the increase in traffic noise which is likely to be experienced on local roadways due to the proposed project. In community noise assessment, changes in noise levels greater than 3 dB(A) are often identified as significant, while changes less than 1 dB(A) will not be discernible to local residents. In the range of 1 to 3 dB(A), residents who are very sensitive to noise may perceive a slight change. No scientific evidence is available to support the use of 3 dB(A) as the significance threshold. The analysis of potential noise level increases on local roadways due to the project indicates that areas along Cajalco Street (Magnolia to the project) and along Magnolia Avenue (1-15 to Cajalco) will experience an increase in noise greater than 3 dB(A). The resulting Existing plus Project noise levels, however, will total less than 75 dB(A). These areas are zoned for Commercial Industrial uses and will not contain residences. These noise levels are therefore classified as "Normally Acceptable" by California Land Use Compatibility Studies. All residences located along other roadways used for accessing the project will not experience a significant increase in noise due to the project.

TABLE 3-4
INCREASE IN TRAFFIC NOISE LEVELS

Roadway	Increase in Noise due to Project (dBA)
Magnolia Avenue	
- East of McKinley	0.4
- I-15 to Cajalco	6.9
- El Sobrante to Rimpau	0.7
Cajalco Street	
- South of Magnolia	17.7
I-15 Freeway	
- Magnolia to 6th Street	1.1
- Magnolia to Old Temescal Road	0.4

3.3.3 Mitigation Measures

1. *A performance condition shall be imposed on the mining site operations. A performance condition shall allow the site operations to proceed as long as specific noise levels (i.e., the Model Noise Ordinance or equivalent) are not exceeded. Analysis shows that the project would comply with typical noise ordinance levels. However, if problems arise, equipment or operations shall be modified in such a way that acceptable noise levels are maintained in adjacent residential areas. If such mitigation becomes necessary, the following measures shall be implemented as required to reduce noise levels.*

   - *Noise generated by earth moving equipment comes from a variety of sources, including exhaust noise, mechanical and engine noise, and contact with ground. The most significant of these is related to the exhaust system. Several grades of mufflers are available for earth moving equipment. The mufflers are commonly ranked as stock, residential, or hospital, with hospital mufflers resulting in the most quieting. Tuning the engines may also lower noise levels generated.*

   - *Reducing the number and size of equipment can result in lower noise levels. Generally, the smaller the equipment the less noise generated. However, small equipment would require longer operation (and longer periods of impact) than when large equipment is used. The balance of noise levels should be evaluated.*

   - *Installing acoustic blankets around drilling operations can be used to reduce potential drilling noise. These acoustic blankets could reduce the drilling noise by 3 to 5 dB(A).*

   - *Temporary or permanent noise barriers can be employed around mining site and equipment. The barriers may be walls, berms, or stockpiles of processing material.*

2. *Initial blasting shall be limited to 2,000 pounds of explosive per 8 ms blast increment. Seismic monitoring at the start of operations shall be completed to determine the actual vibration levels from the blasts. The appropriate amount of explosives that limits potential impacts can be determined from these measurements. Blasting shall be avoided during meteorological conditions (inversions) that result in higher blast levels. Other mitigation measures related to blasting are detailed in Section 3.8.3, Public Safety Mitigation Measures.*

3. As required by the Riverside County Zoning Ordinance, all uses of the property, other than maintenance, shall be confined to the hours between 6:00 A.M. and 10:00 P.M., except those operations located not less than 300 feet from the outer boundary of the property.

3.3 AIR QUALITY

Introduction

The following section is based on studies and calculations provided by Mestre Greve Associates. Their complete report is included in Appendix 5.7.

3.3.1 Environmental Setting

The local weather conditions are dominated by regional wind patterns. Most significant to the site are the regular daytime on-shore sea breezes. At night the wind generally slows and reverses direction, traveling towards the ocean. The wind conditions are fairly constant, with the frequency of calm winds (those less than two miles per hour) on-site less than ten percent.

The other significant climatic influences on the Corona Quarry project are the frequent temperature inversions. These are generated from two sources. "Ground based inversions" are most severe during clear, cold, early winter mornings, and result in very little mixing or turbulence of the air and high concentrations of pollutants near major roadways. "Elevated inversions", most common during summer months, act as a lid or upper boundary and restrict vertical mixing of air. The result is high levels of ozone.

The air monitoring station nearest to the Corona Quarry project site is the Norco-Corona station, operated by the Southern California Air Quality Management District (SCAQMD). The data collected there is considered representative of the air quality experienced in the vicinity of the project. However, the only pollutant monitored at the Norco-Corona station is ozone. Other data for this project was obtained from the Riverside-Rubidoux station. It should be noted that the latter station is probably less representative, as it is located in and downwind of highly developed areas, unlike the Corona Quarry site.

The air quality data indicates that ozone is the primary concern in the project area. Ozone standards are exceeded on one out of every three days. Ozone is a secondary pollutant, the result of chemical reactions between other pollutants and sunlight. Pollutants emitted from upwind cities are responsible for the ozone levels experienced in the project area.

Particulate concentrations occasionally exceed the Federal standards in the project area. These are products of natural sources, grading operations, and motor vehicles. State and federal standards for lead, nitrogen dioxides, carbon monoxide, sulfur oxides, and sulfates were not violated at the local test stations.

Table 3-5 documents the ambient air monitoring data from the Norco-Corona and Riverside-Rubidoux stations.

TABLE 3-5
AMBIENT AIR MONITORING AIR QUALITY LEVELS

Pollutant	California Standard	National Standard	Year	Maximum Level	Days State Std. Exceeded
Ozone	0.10 ppm for 1 hr.	0.12 ppm for 1 hr.	1983	0.35	141
			1984	0.30	137
			1985	0.35	147
			1986	0.27	140
Particulates (PM10)*	50 ug/m3 for 24 hr.		1984	208	71%
			1985	208	77%
			1986	294	79%
Particulates (TSP)*	260ug/m3 for 24 hr.		1983	285	2%
			1984	278	2%
			1985	335	6%
			1986	346	2%
CO	20 ppm for 1 hr.	35 ppm for 1 hr.	1983	8.0	0
			1984	8.0	0
			1985	8.0	0
			1986	9.0	0
Nitrogen Dioxide	.25 ppm for 1 hr.	.0532 ppm annual avg.	1983	0.19	0
			1984	0.17	0
			1985	0.16	0
			1986	0.16	0

NOTES:

1. Sulfates, lead, and sulfur dioxide standards were not exceed at the Riverside station.
2. Particulate standard for California changed in 1984 to include only matter with an aerodynamic diameter of 10 micrometers or less (PM10.) Federal standard is total suspended particles (TSP). Days exceeding standards are reported in terms of percent days of year. TSP exceedance is reported above Federal Standard.
3. Data for ozone is from the Corona Station. All other data is from the Riverside-Rubidoux Station.

3.3.2 Potential Impacts

Processing Emissions: Processing emissions are those emissions associated with the asphalt, concrete and aggregate production. These emissions include combustion emissions from the equipment and the processing as well as particulate emissions during the processing. These emissions do not include those generated by on-site drilling, blasting and excavating, or those related to off-site vehicular traffic generated by this project.

The principal emission from the Corona Quarry processing plant will be particulates. The amount of particulate emissions will vary depending upon the level of emission controls to be used. However, the SCAQMD, through its Regulation XIII, effectively limits the particulate emissions from processing plants to 150 pounds per day, with any emissions above this level to be off-set. The expected processing plant emissions, with typical control equipment, are presented on Table 3-6. The exact emissions will vary depending upon the control equipment selected. However, the total particulate emissions from processing contributed to the local region can not exceed 150 pounds per day.

TABLE 3-6
PROCESSING PLANT EMISSIONS
(Pounds per Day)

Source	*Carbon Monoxide*	*Nitrogen Oxides*	*Sulfur Oxides*	*Parti-culates*	*Hydro-carbons*
Asphalt Plant	61	58	1	*	45
Concrete Plant	---	---	---	*	---
Aggregate Processing	---	---	---	*	---
On-site Equipment Combustion	304	40	6	5	19
TOTAL	**365**	**98**	**7**	**150**	**64**
SCAQMD Reg. XIII Limits	550	100	150	150	75

* The combined particulate emissions from all processing are required to be less than 150 pounds per day.

Fugitive Dust Generation: Dust will be generated from the mining and transport activities proposed on-site. These emissions are a result of drilling, blasting and earth moving. Approximately one acre of the project site will be worked in any one day. Emissions will be controlled by watering the area prior and during excavation or the use of soil stabilizers. Such methods can reduce fugitive dust emissions by 50 percent. The following estimate is projected for the blasting and mining operations on-site:

Particulates (TSP) 104 pounds per day

Included as part of the particulate emissions are the unpaved haul road emissions from fugitive dust generation. Note that these particulate emissions are primarily large particles that tend to settle out of the atmosphere. Only 20 percent of these emissions are of the 10 microns or less size.

Off-Site Vehicular Emissions: The off-site vehicular emissions generated by the proposed project include truck and non-truck emissions. The project will result in substantial truck traffic for the delivering of the processed materials. The traffic study estimates that the project will result in 1,740 truck trips per day. The estimated length of the average truck trip will be 20 miles, projecting to a cumulative 34,800 truck miles per day for the proposed operation. The traffic report also projects 43 non-truck trips per day due to the proposed operations. The average non-truck trip will be 15 miles long at 20 miles per hour average speed. The emission estimates based on these assumptions are as follows:

Carbon Monoxide	1,393 pounds per day
Hydrocarbons	240 pounds per day
Nitrogen Oxides	839 pounds per day
Particulates (TSP)	254 pounds per day
Sulfur Oxides	221 pounds per day

The above cited emissions actually represent a decrease in the vehicle-related pollutants which would be generated if the project were not to proceed. This is due to the fact that the project is located within the rapidly developing Orange County-Western Riverside County aggregate consumption region. If no substantial aggregate quarry is established within this area, aggregates necessary to build the houses and roads in this area will have to come from existing quarries located outside of the region (Irwindale, San Bernardino County, Palmdale). The average truck trip length required to import these products would be approximately 35 miles. Table 3-7 illustrates the reduction of vehicular emissions which would be realized by the establishment of the Corona Quarry.

TABLE 3-7
VEHICULAR EMISSIONS REDUCTIONS
REALIZED BY THE ESTABLISHMENT OF CORONA QUARRY

(Pounds Per Day)

Pollutant	*Project Emissions*	*Current Quarry Emissions*	*Reduction in Emissions*
Carbon Monoxide	1,393	2,076	683
Hydrocarbons	240	359	119
Nitrogen Oxides	839	1,256	417
Particulates	254	380	126
Sulfur Oxides	221	322	101

Total Emissions: The total emissions for the proposed Corona Quarry project are summarized in Table 3-8.

TABLE 3-8
TOTAL EMISSIONS FOR CORONA QUARRY

(expressed in pounds per day)

Source	*Carbon Monoxide*	*Hydro-carbons*	*Nitrogen Oxides*	*Parti-culates**	*Sulfur Oxides*
Processing Emissions	365	64	98	150	7
Fugitive Dust Generation	---	---	---	104	---
Off-Site Vehicular	1,393	240	839	254	215
TOTAL	**1,758**	**304**	**937**	**508**	**222**
Reduction as result of shorter truck travel	683	119	417	126	101
TOTAL	**1,075**	**185**	**520**	**382**	**121**

**Note: SCAQMD limits particulate emissions from processing operations to 150 pounds per day. This agency does not have specific limitations for emissions from the remainder of the activity which will occur on-site.*

It is important to note that the particulate emissions generated by the project will be predominantly of a larger size than the 10 micrometers or less size considered to be a health hazard. These smaller particles are typically a by-product of combustion. The larger particles produced on-site will tend to fall out of the atmosphere onto or downwind of the site itself. Downwind is normally towards the east during daytime (operating) hours. This is hilly, undeveloped land. The residences in the area are located in a generally upwind area.

3.3.3 Mitigation Measures

Compliance with SCAQMD Rules and Regulations will result in mitigation of impacts for the Corona Quarry project and acceptable air quality levels in adjacent areas. These regulaations require that the project proponent apply the best available control technology to their operations. These measures are expected to include one or more of the following:

- *A foam dust suppression system on processing equipment.*
- *Watering of all haul roads and use of dust palliative, as necessary.*
- *Baghouse installed on asphalt plant.*
- *Baghouse installed on ready-mix plant.*

During the rare times when daytime winds are out of the west, additional mitigation measures to minimize particulate emissions in local residential areas shall be implemented. These measures include use of watering during grading activities and additional watering during blasting or delaying of blasts until more favorable wind conditions are realized.

3.4 VEGETATION AND WILDLIFE

Introduction

The following discussion summarizes the results of an extensive literature and in-the-field review performed by Tierra Madre Consultants for the subject EIR. The complete study is included as Appendix 5.8.

3.4.1 Environmental Setting

The proposed 336.92-acre site is situated along the floodway of the Temescal Wash and on the rugged hillsides to the east. The wash area is subject to highly irregular flows, as described in Section 3.1, Hydrology and Drainage.

The soils occurring on the site are not known to support unusual vegetation or floral species of limited distribution. Table 3-9 lists the soils which are found on the site and where they tend to be located.

TABLE 3-9
CORONA QUARRY SOILS

Symbol	*Soil Type*	*Typical Location*
CaD2	Cajalco fine sandy loam	8-15 percent slopes, eroded
CaF2	Cajalco fine sandy loam	15-35 percent slopes, eroded
CpA	Cortina gravelly sandy loam	0-2 percent slopes
PlD	Placentia fine sandy loam	5-15 percent slopes
RuF	Rough broken land	
TbF2	Temescal rocky loam	15-50 percent slopes, eroded

Vegetation: With the exception of two areas containing riparian vegetation, the entire site consists of partially degraded non-native grassland and coastal sage scrub plant communities. It appears that the site formerly contained a greater percentage of coastal sage scrub, but many years of stock grazing, along with frequent wildfires, have apparently limited the distribution of this habitat. The annual grassland and the coastal sage scrub on the property have blended into a single community. At this time, it is impossible to ascertain whether the coastal scrub is being crowded out by the non-native grasses or is actively regenerating. The dominant coastal sage scrub species on the site include brittlebush and California sagebrush, with lesser amounts of California buckwheat, laurel sumac, black sage, and Palmer's goldenbush. The understory is comprised mainly of red brome, slender wild oat, ripgut grass, abu mashi, short-pod mustard, star-thistle, red-stem filaree, doveweed, and fiddleneck. These plants dominate the annual grassland habitats. Weedy species, such as common sunflower, telegraph weed, western ragweed, and wild lettuce, occur mainly along roadsides.

Riparian communities occur in two drainage area on the property. A portion of the Temescal Wash itself comprises the largest of these communities. Most of the 1,200 feet of wash traversing the site is usually dry, and dominated by mulefat. Emergent black willow is present, mostly along the margins of the wash. Introduced giant reed and tamarisk are invading the area.

The highest quality riparian environment occurs outside the project boundary to the south of the site, where run-off from the neighboring asphalt plant has produced a year-round 1-acre pond in an abandoned settling basin. Around this pond exists a willow riparian woodland/freshwater marsh of very high quality. The northern border of this riparian community is on the Corona Quarry site. Black willow is the dominant tree in the community, with mulefat, tamarisk, young arroyo willow, and freshwater marsh plants forming the understory.

A similar depression bordering the pond on the north side, but at an elevation about ten feet higher, does not contain water year-around, and is in a disturbed state. It contains mostly weedy species such as red brome, short-pod mustard, and London rocket.

The other riparian area on site is located near the southeast corner of the site. This drainage contains a willow/mulefat riparian scrub community. It is dominated by mulefat, with clumps of tree-sized black willows occurring at various points along the drainage. One side canyon contains a small, but especially well-developed, willow woodland. Willows in this area have attained a height of approximately 30 feet.

The plant communities found on the Corona Quarry site are shown on Figure 15.

Wildlife: The most valuable wildlife habitats are associated with the riparian plant communities. The dense and diverse vegetation in these areas support an equally dense and diverse faunal community. The riparian ecosystems are especially important in providing food and cover for birds. Other plant communities adjacent or near riparian habitats also exhibit increased diversity of avian species. Field surveys of the Corona Quarry site resulted in the sighting of 37 species of birds, with the vast majority observed in the willow riparian communities.

The area around the year-around pond near the southwest corner of the site is important to local animals as a source of water. During the field surveys, tracks of raccoons and coyotes were evident in the mud surrounding the pond. Pacific treefrogs and bullfrogs were observed around the margins of the pond.

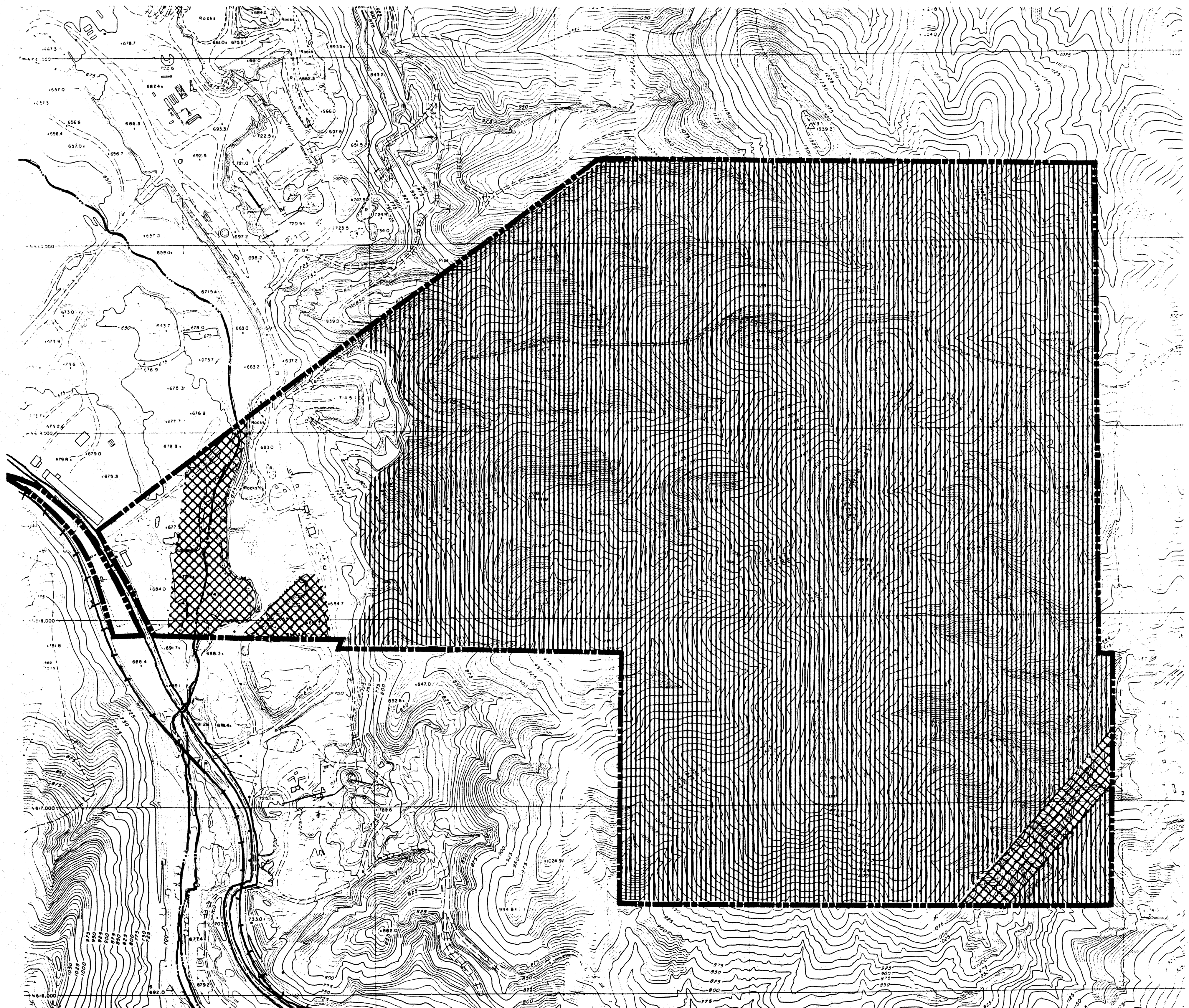
The annual grassland/coastal sage scrub on the site is less important overall as a wildlife habitat. This community produces green plant material and seed which are utilized for food by a wide variety of birds and small mammals. The areas containing moderate to dense shrub cover (coastal sage scrub) have somewhat more structural diversity than the more open areas. This increased diversity undoubtedly results in an increase in use by wildlife in these areas. Another important use of the more open areas of the property is foraging by raptors.[9]

Figure 16 illustrates the on-site location of the animal species mentioned herein.

Sensitive Species: A sensitive species classification results from limited distribution, restricted habitat requirements, particular susceptibility to human disturbance, or a combination of these factors. Two sensitive animals have been previously documented within the vicinity of the Corona Quarry site: San Diego horned lizard and orange-throated whiptail. However, field studies have not revealed the presence of either of these species. Two additional sensitive animals were detected during these on-site surveys: golden eagle and California black-tailed gnatcatcher. Golden eagles nest in rugged mountainous areas with adjacent open grasslands or scrublands where they pursue their prey. They feed mainly on ground squirrels, rabbits, and other small to medium-sized mammals. A nesting pair usually has a feeding range of about 35 square miles. Threats to this species are numerous: eggshell thinning due to pesticide ingestion, loss of habitat, poaching, electrocution from high-voltage power lines, and poisoning during predator control programs. No suitable nesting sites occur on the site; cliff faces are not steep enough to discourage predators. However, during field surveys two golden eagles were seen soaring over the eastern boundary. A 1981 survey in the area noted a potential golden eagle nest site within approximately 2 miles of the project site.

[9]California Department of Fish and Game, *Areas of Special Biological Importance,* 1979.

PLANT COMMUNITIES



LEGEND

COASTAL SAGE

RIPARIAN

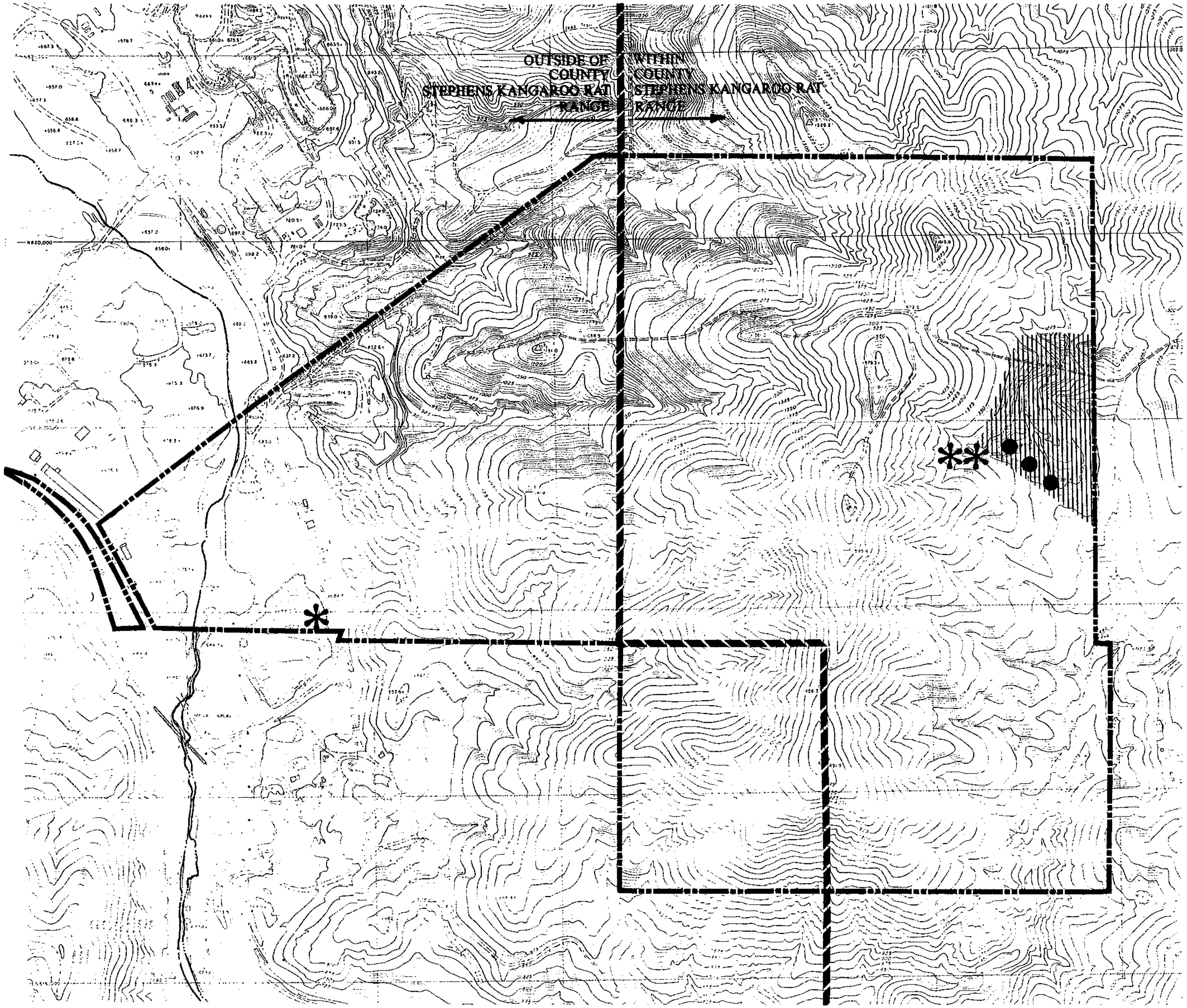
SOURCE OF INFORMATION:
TIERRA MADRE

CORONA QUARRY
CALMAT CO.

0 100 200 400 600

FIGURE 15

ANIMAL HABITATS



LEGEND

- RIVERSIDE COUNTY STEPHENS KANGAROO RAT RANGE
  SOURCE: RIVERSIDE COUNTY GENERAL PLAN
- SUITABLE STEPHENS KANGAROO RAT HABITAT
  SOURCE: TIERRA MADRE
- ● SUCCESSFUL TRAPPING LOCATIONS – STEPHENS KANGAROO RAT
- * BLACK-TAILED GNATCATCHER SITINGS

CORONA QUARRY
CALMAT CO.

FIGURE 16

The California black-tailed gnatcatcher is a coastal race of the black-tailed gnatcatcher which is restricted in habitat to areas containing coastal sage scrub in Southern California and Baja California. This species is undergoing severe population losses due to destruction of suitable habitat in recent times. The remaining population of this race was estimated in 1980 at about 1,335 pairs. Approximately 400 pairs are estimated to occur in Riverside County.[10] Although this species breeds only in coastal sage scrub, they are known to use other plant communities, including riparian, for foraging. One individual was seen in the riparian area on the west side of the property during the field studies. Two others were observed near the eastern property boundary in moderately dense brittlebush, which is a suitable breeding habitat. Considering that the observations of this species were made on both the east and west sides of the site, and that much suitable habitat exists throughout the site, a significant population may be present.

There is much local concern about the Least Bell's vireo, a sensitive bird species which nests in riparian habitats. No Least Bell's vireos were seen on the site, and they probably do not nest there due to the fact that they prefer dense stands of willows and similar vegetation. The sparser riparian vegetation found on the Corona Quarry site would not likely support this species. Within the general vicinity of the site, at the Prado Dam area to the northwest, there are extensive areas of Least Bell's vireo habitat which are currently unoccupied due to parasitism by cowbirds. Elimination of the introduced cowbirds, rather than creation of additional habitat is currently of greater concern.

Endangered Species: Three individuals of a federally-listed endangered species were found on the site. The Stephens kangaroo rat, which was approved for the federal list effective October 30, 1988, is found only in the San Jacinto Valley and nearby valleys of western Riverside and northern San Diego counties. (Figure 17 illustrates the suitable habitat areas for the Stephens kangaroo rat, as identified in the County General Plan.) This species prefers level to slightly sloping terrain with vegetative cover limited primarily to annual grasses and/or herbaceous plants. The trapping survey conducted by Tierra Madre Consultants resulted in the capture of three Stephens kangaroo rats. All were trapped in an area of approximately two or three acres on the eastern property boundary.

This species is known to occur alongside the Pacific kangaroo rat species, a similar species with a much more widespread distribution. These two species are nearly identical in appearance and can generally be distinguished only by persons specializing in kangaroo rats. The only diagnostic test to differentiate between the two requires an autopsy, which is not a reasonable method for identifying an endangered species. Instead a number of variable characteristics are studied by an experienced biologist. The characteristics of a Stephens kangaroo rat include dorsal color, size of the ear, and tail stripes. [11]

The Stephens kangaroo rat inhabits underground burrows which it excavates or, in some cases, re-excavated burrows which have been abandoned by gophers. The species is nocturnal, emerging to feed on vegetation and seeds, and to take dustbaths in dry, shallow dusty depressions. Kangaroo rats often cache food in their burrows or nearby holes, presumably for periods when food is otherwise unavailable.

Since the Stephens kangaroo rat has only recently been listed as an endangered species, ordinances to protect the species have not yet been enacted. Currently County consultants and task forces are creating these regulations. It is anticipated that a fee area will be established, roughly conforming to the presumed historical habitat of the species. The funds generated from development fees required within this area will help finance the acquisition of habitat preserves. Rats found in other areas will be transferred to these sites and protected.

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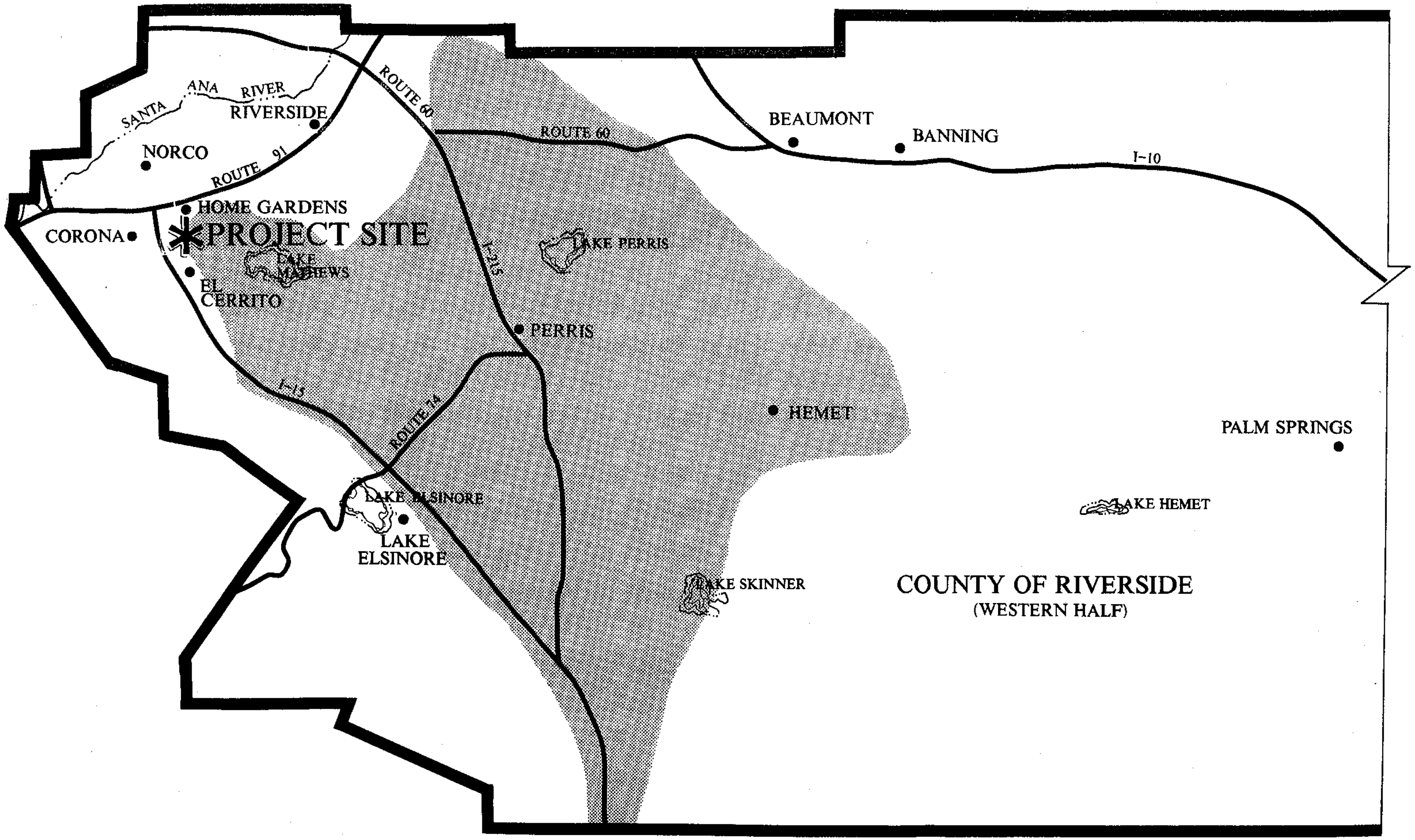
[10] Atwood, J.L., "The United States Distribution of the California Black-tailed Gnatcatcher," in *Western Birds*, Volume 11, Number 2, pp. 65-78.

[11] Richard Dean Friesen, *Stephens Kangaroo Rat Study, Temescal Valley Properties, Riverside County, California*, March 1984, p. 5.

RIVERSIDE COUNTY STEPHENS KANGAROO RAT STUDY AREA



SOURCE:
RIVERSIDE COUNTY GENERAL PLAN

CORONA QUARRY
CALMAT CO.

FIGURE 17

3.4.2 Potential Impacts

The Corona Quarry will result in surface disturbances over the majority of the site. The only areas where destruction of existing resources will not occur are along the margins of the property (setbacks). These undisturbed setbacks actually contain the majority of the critical riparian habitats noted above.

The riparian habitat in the southeast corner of the site, as shown on Figure 15, may be subject to impacts from increased sedimentation resulting from quarrying and processing. This increased sedimentation could adversely affect or even destroy the riparian vegetation.

The impacts resulting from quarrying and processing on the remainder of the site will include direct impacts destruction of California black-tailed gnatcatcher habitat and loss of over one-half square mile of raptor foraging habitat. These impacts will contribute to the cumulative reduction of such habitats in the region.

The impact on the Stephens kangaroo rat cannot be determined at this time. The mining in the area which contains its habitat will not occur for at least two decades. Whether the Stephens kangaroo rat will still be viable on-site at that time (due to the general decline of the species) is unknown. Mining will result in a loss of less than five acres of habitat.

3.4.3 Mitigation of Impacts

1. *Riparian areas on the southwest end of the project site shall be preserved. The processing plant shall be located at least fifty (50) feet from riparian areas.*

2. *If disturbance or removal of riparian vegetation is unavoidable, as determined by the Board of Supervisors, alternative mitigation shall take the form of enhancement of the existing wetland communities near the permanent pond in the southwest corner of the site. This pond may be expanded by excavation and inundation, and allowed to vegetate naturally as the existing pond did.*

3. *Invasive non-native plants, such as tamarisk and giant reed, shall be removed to further enhance the existing riparian habitats. The riparian sites shall be monitored annually to prevent reestablishment of these weed species, especially in the pond area.*

4. *Additional water will be required to maintain the water level in the expanded pond. If this habitat is not enlarged, a wildlife guzzler (a kind of drinking fountain for wildlife) shall be installed in the area to benefit the native animal species. Erosion and sediment controls shall be installed to protect the pond from increased sedimentation due to quarrying or processing.*

5. *At the time when mining progresses to within 200 feet of the Stephens kangaroo rat habitat (as identified on Figure 18 of this document), a field study of the area shall be performed by a biologist qualified to identify the species. If any individuals are found on-site they shall be captured and then released in the preserve sites which the County of Riverside is in the process of establishing.*

6. *All existing and future ordinances regarding the preservation of the Stephens kangaroo rat shall be observed and obeyed.*

3.5 CULTURAL, HISTORICAL AND PREHISTORICAL RESOURCES

Introduction

This discussion is based upon a number of sources including an in-field reconnaissance conducted by Scientific Resource Surveys for the subject EIR. A complete copy of their report is located in Appendix 5.9, herein.

3.5.1 Environmental Setting

Temescal Wash, which at one time afforded a year-around water supply, was important to the native Luiseno Indians, a hunting-gathering society of the Shoshoneans. They would have likely crossed the lower elevations of the site in their searches for water and acorns, a staple of their diet. However, the rugged terrain would have likely limited their use of this site, as it did the later ranchers and settlers.[12]

The Corona Quarry site is located on property ranging in elevation from around 676 feet Mean Sea Level (MSL) in the floodplain to over 1600 feet MSL in the hills on the east side of the site. The topography of the site is generally rugged, with slopes exceeding 45 degrees over 50 percent of the property.

Prehistorical Resources: No prehistoric sites have been recorded on or within one mile of the Corona Quarry site. Field investigations by Scientific Resource Surveys did not locate any such resources. Any evidence of prehistoric utilization of the wash area would have been destroyed by the frequent flooding of the area. The remaining topography is generally too steep to have been inhabited in prehistoric times.

The geologic units occurring on the subject property have no potential for yielding paleontological specimens. Three geologic units are known to occur on the Corona Quarry property. Jurassic-Triassic metavolcanics (specifically, Santiago Peak Volcanics) have no potential as paleontological resources due to their volcanic origins. Mesozoic granodiorite are granitic by nature, which is not conducive to paleontological findings. Recent alluvium consists of unconsolidated stream, river ;channel, and alluvial fan deposits. This geological unit has very low paleontological potential, due to its mode of deposition. It is possible, however, that isolated remains could be found in this material during grading.

Historical Resources: The first exploration of the project area occurred in 1774 by Juan Bautista de Anza. He left Sonora, Mexico to search for an inland route to northern California, leading 34 soldiers through the region and crossed the Santa Ana Mountains enroute. Two years later, de Anza returned to the area, leading a group of over 300, plus several hundred head of cattle, horses and mules along his earlier route. This hazardous journey provided a link between Mexico and Spain's northern outposts which were threatened by a Russian take-over.[13]

This area was once part of the vast Mission San Gabriel lands, which stretched from San Gorgonio Pass to the east, to the Pacific Ocean in the west. After the missions were secularized in 1834, a portion of the mission lands were sold to Juan Bandini. This includes a 4,500-acre parcel called Rancho Rincon, upon which the present Corona Quarry site is located. In 1846, Bandini sold the rancho to Bernardo Yorba. In 1886, a land boom saw the founding of the City of South Riverside. This city is now called Corona.[14]

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[12]Drummy-Chapel, Vada, *Historical Assessment of the Temescal Valley Project, County of Riverside, California,* June 1982, pp. 2-3.

[13]Bolton, Herbert E., *Anza California Expeditions,* Vol. III, University of California Press, 1930.

[14]Patterson, T., *A Colony for California,* 1971.

The mining history of the Corona area is almost as long as the residential one. In 1888 the first quarry in the region was established. Temescal Wash has been the location of aggregate mining since the 1920s. Specifically, the 3M Company has operated a 1,000-acre quarry one mile south of the Corona Quarry site for the past 41 years. A number of other quarrying operations are currently active along the wash. (See Figure 8.)

3.5.2 Potential Impacts

No cultural resources were discovered during the literature searches and field surveys of the Corona Quarry site. No further evaluation or testing of the site is recommended.

3.5.3 Mitigation of Impacts

The probability of encountering undetected cultural resources during the mining and processing on the Corona Quarry site is very low. The applicant should be required, however, to file a written plan with the County of Riverside for the protection of such resources should any be unearthed or detected during the mining operations.

3.6 VISUAL AESTHETICS

3.6.1 Environmental Setting

The existing site is dominated by the rugged peaks of the El Sobrante de San Jacinto mountains. The high spot on the site is also the highest point in the western end of this small range, which stretches from approximately Corona in the west and Perris in the east, from the Riverside Freeway on the north and Lake Elsinore on the south. Though these peaks are overshadowed on clear days by the much higher Santa Ana Mountains to the southwest, the range is important visually on a local scale, especially on those days when air pollution obscures the more distant mountains. On many days however, the air quality is such that the El Sobrante range itself is not visible except at very close range (less than 1,000 feet).

As described in Section 3.4, Vegetation and Wildlife, these slopes are sparsely covered with coastal scrub vegetation. In many areas, large rock out-croppings are exposed. On clear days the site is visible from residential, commercial and industrial lands surrounding the site, and from the Riverside (State Route 91) and Corona (Interstate 15) Freeways. I-15 has been designated as an Eligible State Scenic Highway from Corona south to the junction with I-215. However, the portion of this route which lies between Corona and the junction with State Highway 74 (and which passes close by the Corona Quarry site) is heavily impacted by extractive resource operations and is not considered by the County of Riverside (according to the General Plan) to be a desirable State Scenic Highway route. The County has stated that efforts to have this portion of I-15 deleted from the State Master Plan of Eligible Scenic Highways are appropriate.[15]

The natural relief of these mountains has already been impacted by mining at low elevations along their western faces. A permitted riprap quarry has operated since the 1950's on the Corona Quarry site. On property adjacent to the site to the north a large face has been excavated by All-American Asphalt. Asphalt hot plants and concrete batch plants operate adjacent to the site to the north and south.

3.6.2 Potential Impacts

The greatest visual impact that would be precipitated by the Corona Quarry site would be a result of topographical changes over the next 75 years or more. Over 1,000 feet of elevation will be removed from the highest portion of the site. The most dominant peak in the local area will be replaced with a deep pit. These significant elevational alterations will take place over a great deal of time. The mining projections indicated that extraction will not be completed for at least a century.

The Riverside County General Plan states that development in hillside areas (slopes of 25% or greater) should be designed to follow or flow with the natural contours of the site. Ridgeline, canyon edges and hilltop development is discouraged. The Corona Quarry project will cause significant alteration of peaks and ridgelines.

To a lesser degree, the processing plants to be located on the site will be visible. Equipment and stockpiles will be visible from the north and west. However, the site is not visible from close range, except by those using Cajalco Street and Magnolia Avenue. These are both primarily industrial roads. The addition of processing plants would not be a departure from the current land use of the adjacent properties. Large asphalt hot plants are located to the north and south of the site, and a concrete batch plant is located on the property just north of the site. From greater distances, as from the nearby freeways and residential areas, the scale of these structures reduces their impact drastically.

[15]County of Riverside, *Comprehensive General Plan,* Third Edition, December 1987, p. 417.

One factor which will reduce the impact of both the structural and topographical changes is the ambient air quality in the Corona area. According to the South Coast Air Quality Management District (SCAQMD), the State's visibility standards were exceeded in this region on 215 days in 1987 (59% of the year).[16] Under such conditions, the site will not be visible to any but the nearest viewers over half the time. Figure 18 compares a typical view on a relatively clear day, and on a day which exceeded the SCAQMD standards. In the following pages the most significant views into the site will be discussed and illustrated.

Views from the West: Figure 19 illustrates typical pre-project views of the Corona Quarry site from the west. A number of land uses have visual access to the site, due to its dominant height. The nearest development in this area is BelAir Homes. Some of the residents in this development have a view of portions of the site, except during the heaviest air pollution episodes. Some of the residential views are screened from the lower elevations by topography. Figure 20 illustrates the view of the existing site from this housing area. Figure 21 illustrates what residents of this area would see during the first phase of mining, within the next 50 years. Figure 22 is the potential view at the completion of mining, at least 75 years hence.

There is currently being considered by the County of Riverside Planning Department a surface mining permit for the Corona Sand and Granite operation. This proposed project will involve grading of a hill located between the proposed Corona Quarry and the residential subdivision known as BelAir. (See Figure 2 for the location of this project.) If grading of this hillside were to take place much of the screening provided by this topography would be lost and the residents of the BelAir community would experience greater visual impact from the Corona Quarry project.

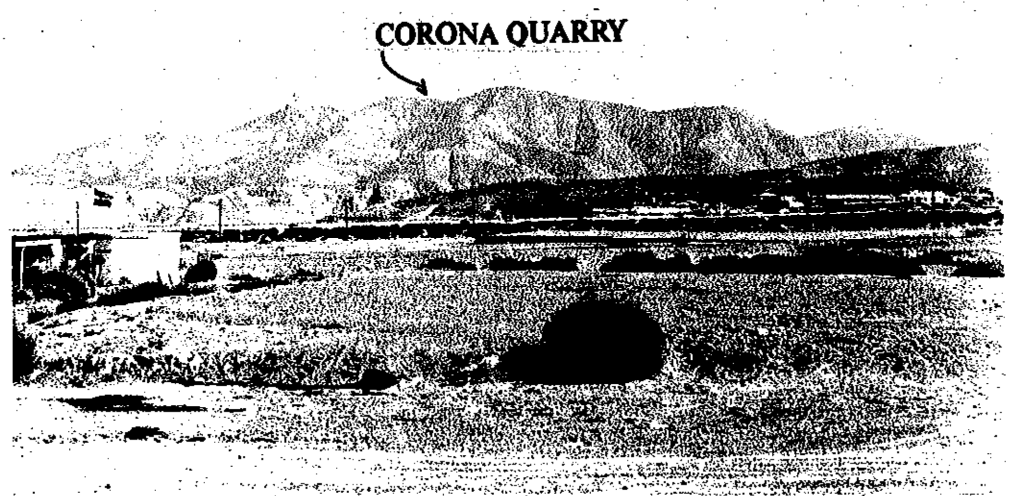
Views from the North: Figure 23 illustrates typical pre-project views of the Corona Quarry site from the north. The most significant views from this direction are from across the Riverside Freeway, where a large mixed-use development known as Corona Hills is under construction. Many of the single-family homes and luxury apartments are oriented to take advantage of the views into the El Sobrante mountains, including the subject site. Again, this area has clear views into the site, although these are obstructed more often by air pollution. Figure 24 illustrates the existing view from a lot soon to be developed as a single-family residence. Figure 25 shows how this view will be altered during the first 50 years of mining. Figure 26 demonstrates the post-mining appearance of the site from this area.

Views from the East: For the most part, the Corona Quarry site cannot currently be viewed from the east. Rugged topography screens most views onto the site. Land uses are restricted to agriculture and open space. Only topographical changes near the completion of mining will be visible from this direction.

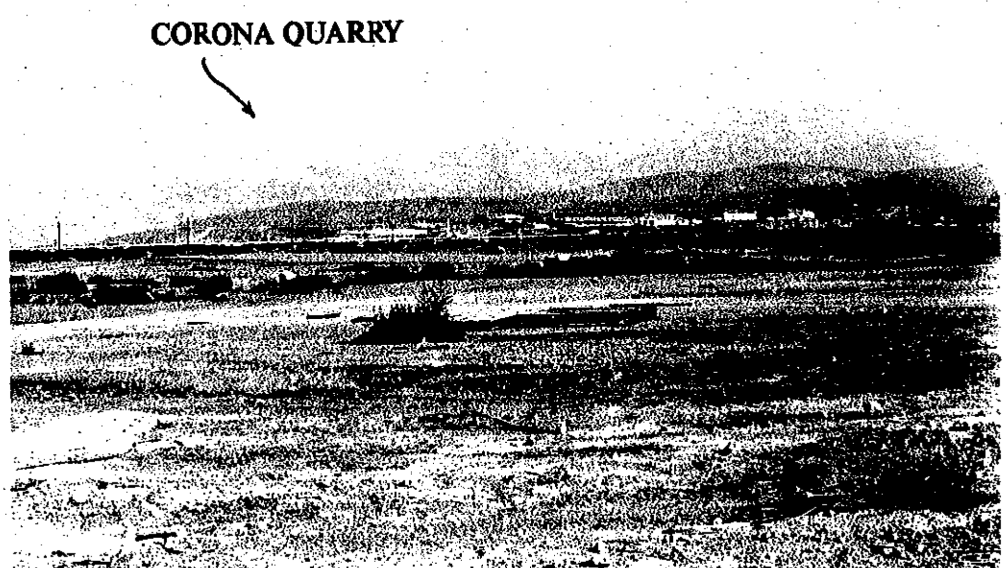
Views from the South: Topography limits views of the proposed Corona Quarry from the south, but the upper elevations of the site are visible from the community of El Cerrito and the rural/residential areas nearby. Figure 27 illustrates the some typical views of the site from this area. Visual impact will not be realized many years into the project life when Phase 2 mining begins.

Freeway Views: Figures 28 to 30 illustrate the progression of mining as viewed from the intersection of Interstate 15 and the Riverside Freeway. Because this section of both freeways is elevated, the most open views of the Corona Quarry will be from this vantage. Topographical changes will be most significant, although they will be incremental over a long period of time. The processing plant will be visible, though not significantly so from this distance and at freeway speed.

[16]South Coast Air Quality Management District, *Summary of Air Quality in California's South Coast Air Basin, Air Quality Data 1987 Update,* 1988.



VIEW OF CORONA QUARRY FROM CALIFORNIA AVENUE, CORONA
CLEAR DAY



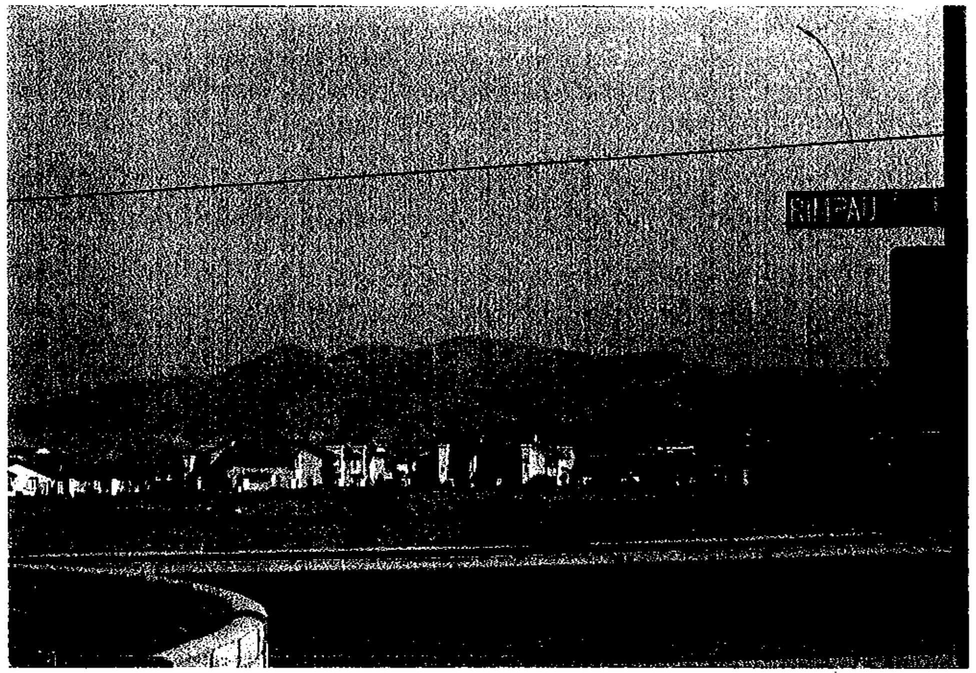
VIEW OF CORONA QUARRY FROM CALIFORNIA AVENUE, CORONA
SMOGGY DAY (59% OF THE YEAR)

VISIBILITY COMPARISONS

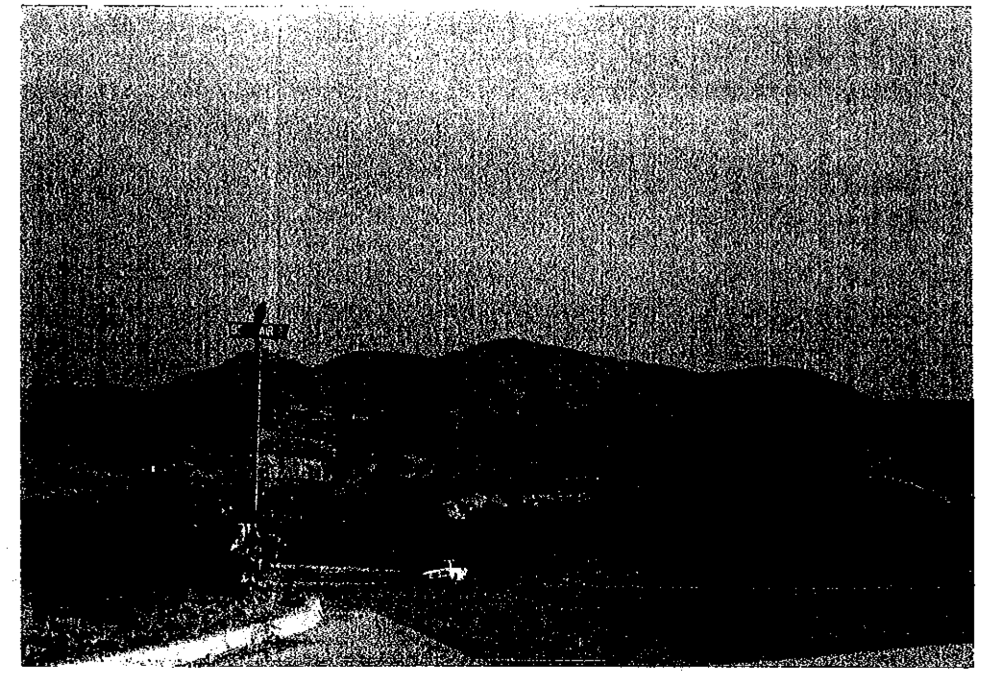
CORONA QUARRY
CALMAT CO.

FIGURE 18

VIEWS OF CORONA QUARRY FROM WEST

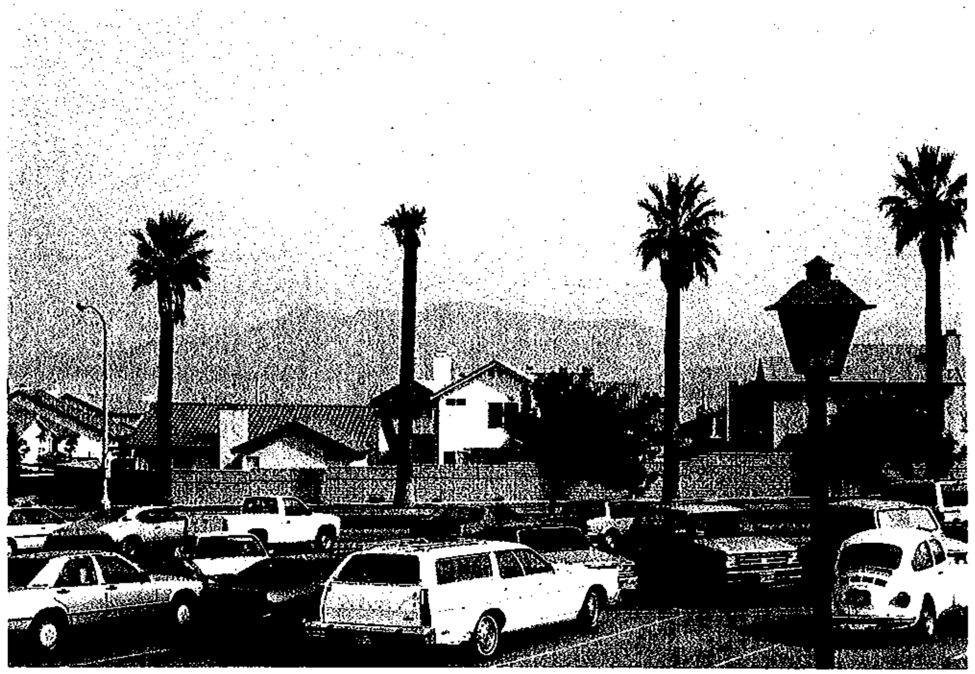


1 RIMPAU AT RIDGEWOOD
SINGLE-FAMILY RESIDENTIAL

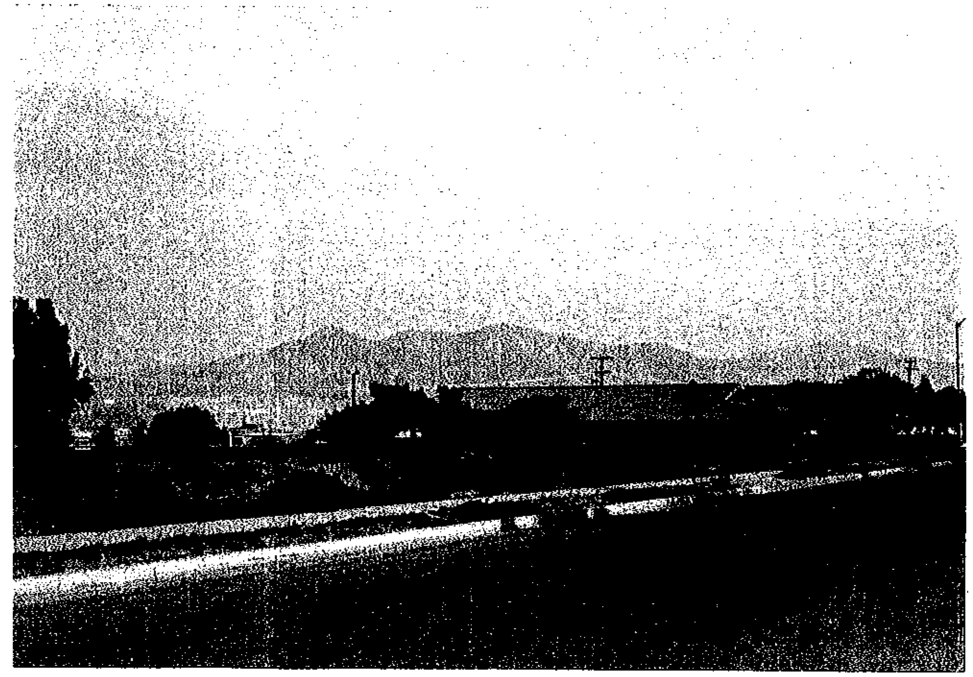


2 BELAIR AT ARTURO BELAIR
UNDEVELOPED RESIDENTIAL

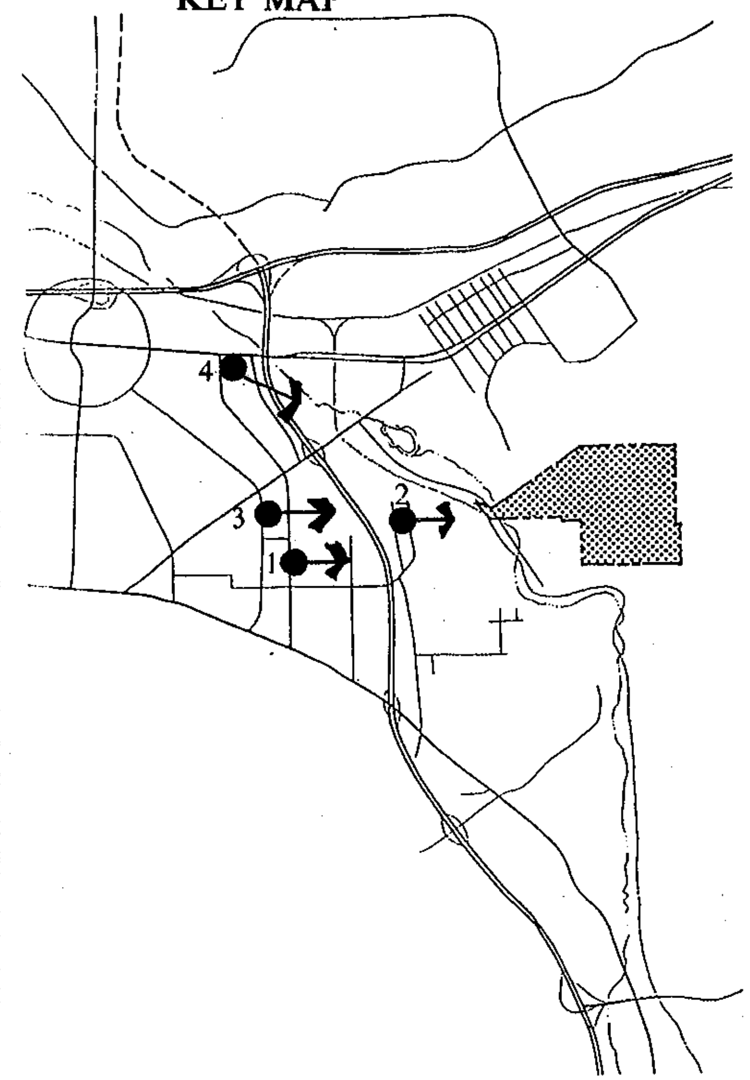
3 FULLERTON AT RIDGEWOOD
SINGLE-FAMILY RESIDENTIAL, ELEMENTARY SCHOOL



4 HOLIDAY AT CIRCLE CITY
MULTI-FAMILY RESIDENTIAL, CONVALESCENCE HOSPITAL



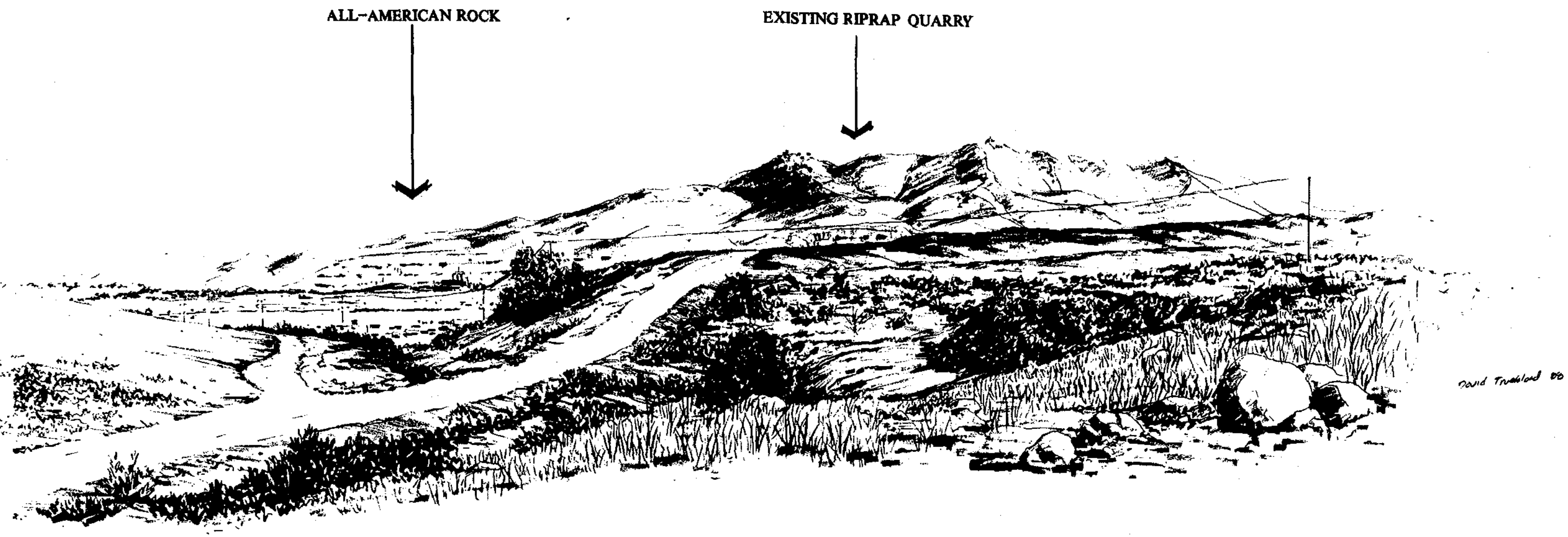
KEY MAP



CORONA QUARRY
CALMAT CO.

FIGURE 19

PRE-PROJECT VIEW FROM BELAIR



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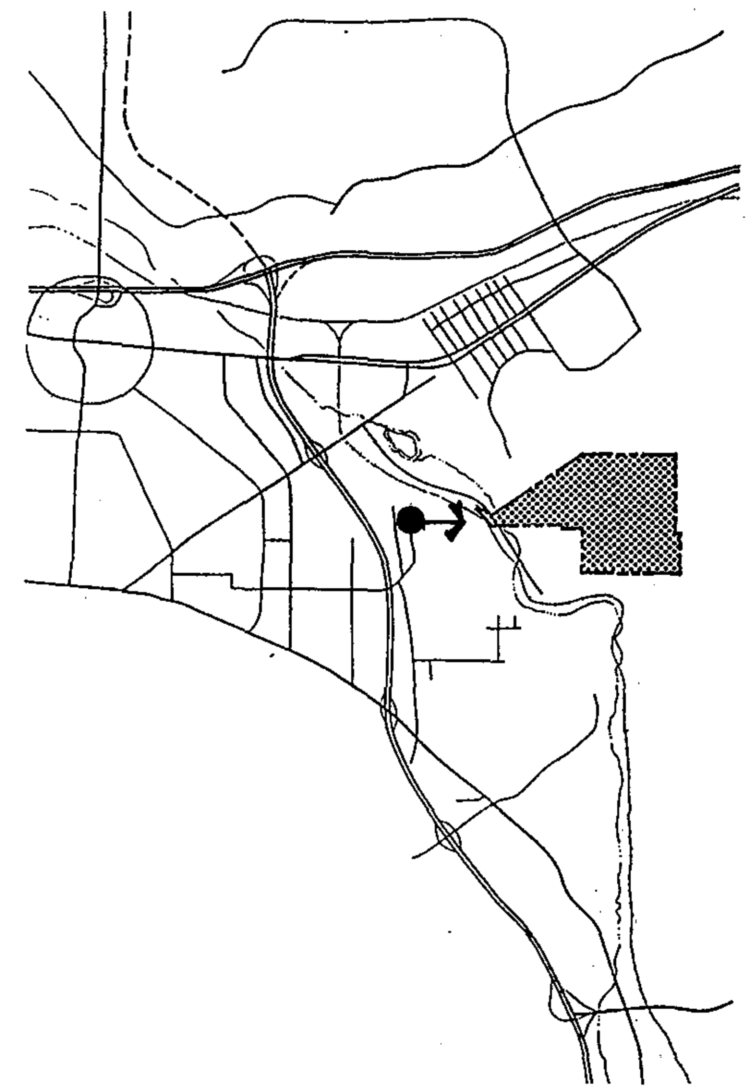
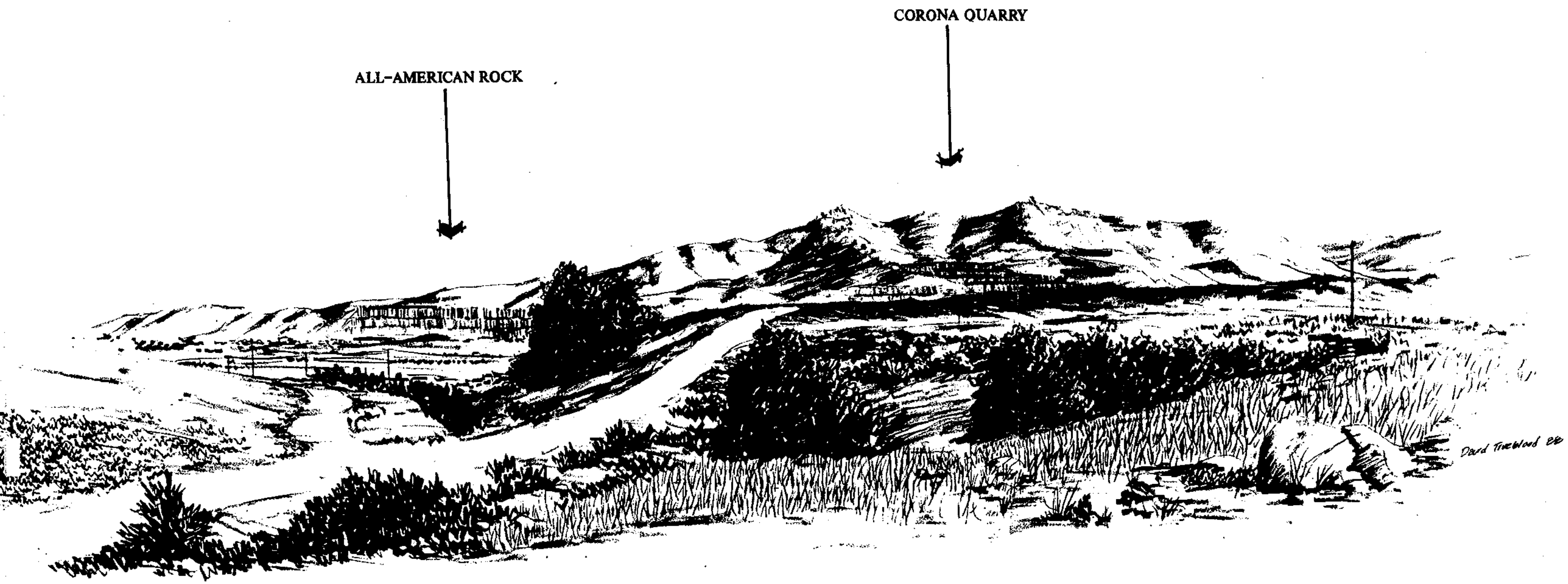


CORONA QUARRY
CALMAT CO.

FIGURE 20

MID-PROJECT VIEW FROM BELAIR



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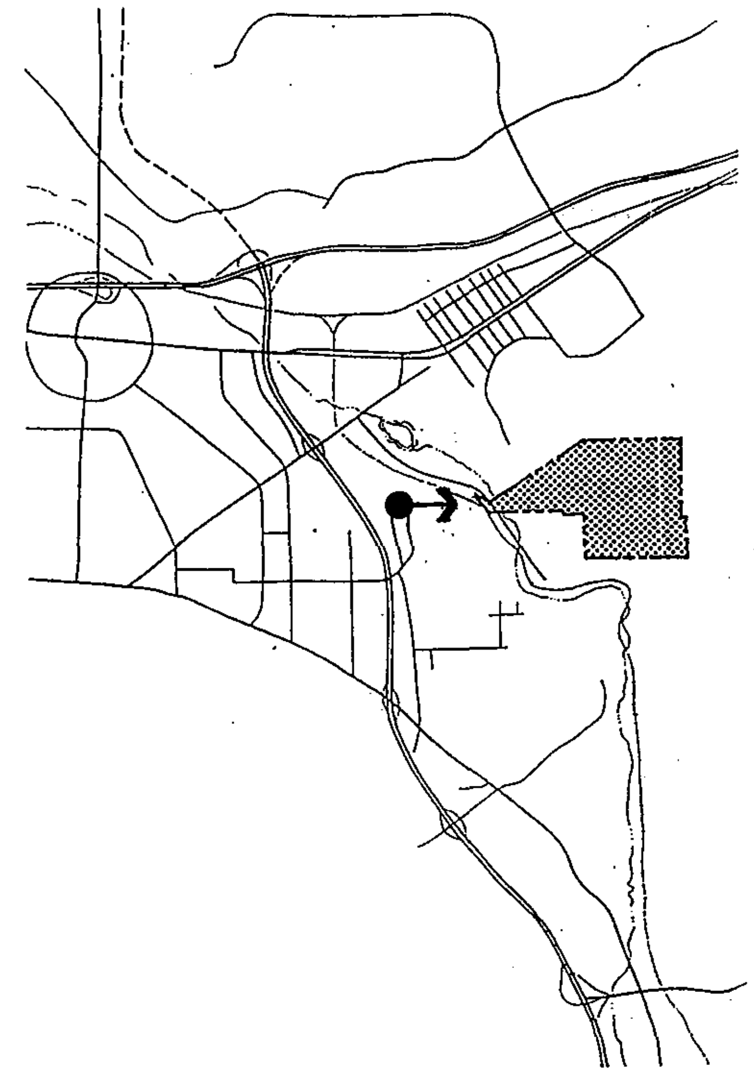
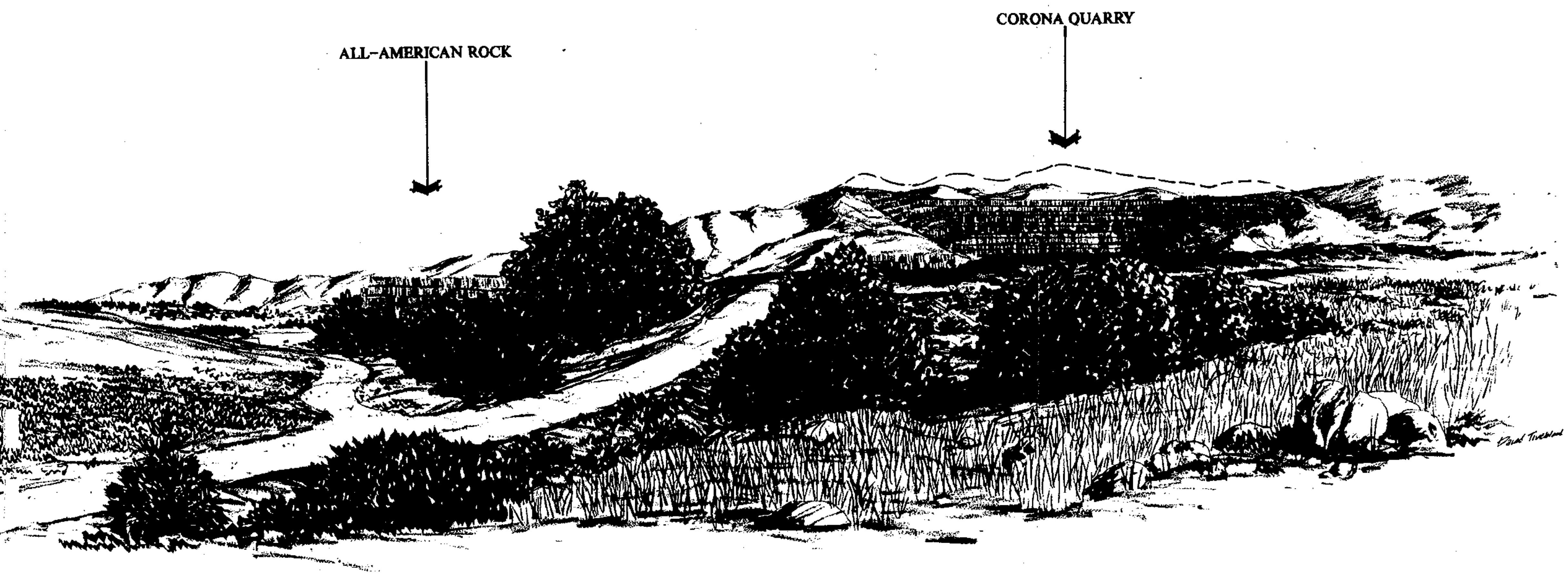


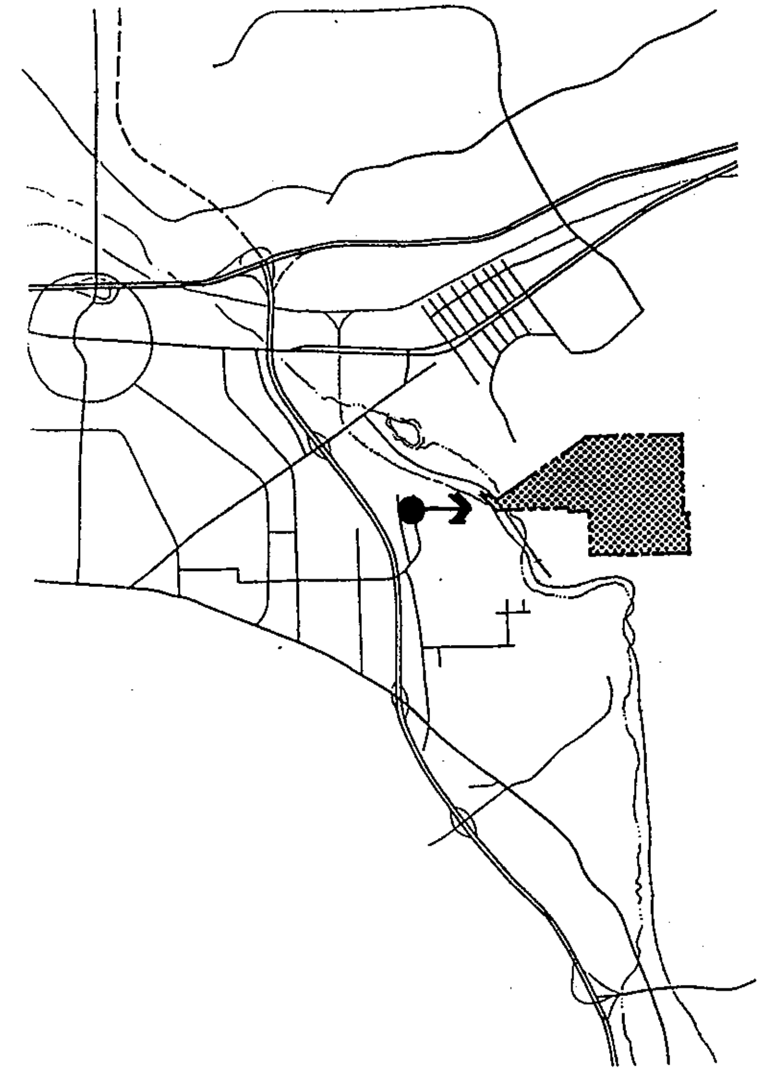
CORONA QUARRY
CALMAT CO.

FIGURE 21

END-PROJECT VIEW FROM BELAIR



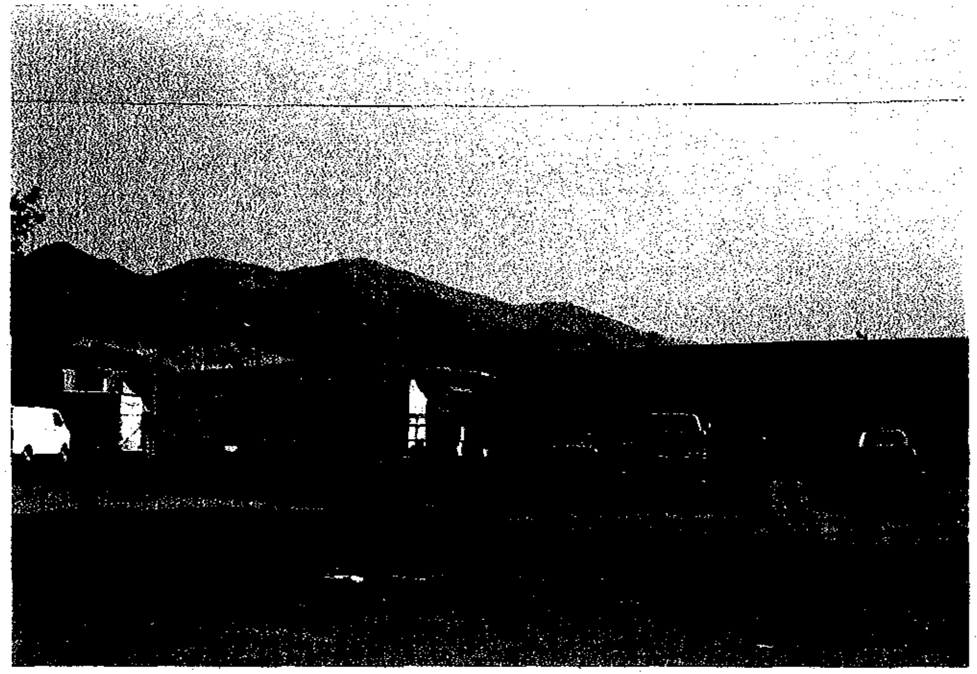
KEY MAP



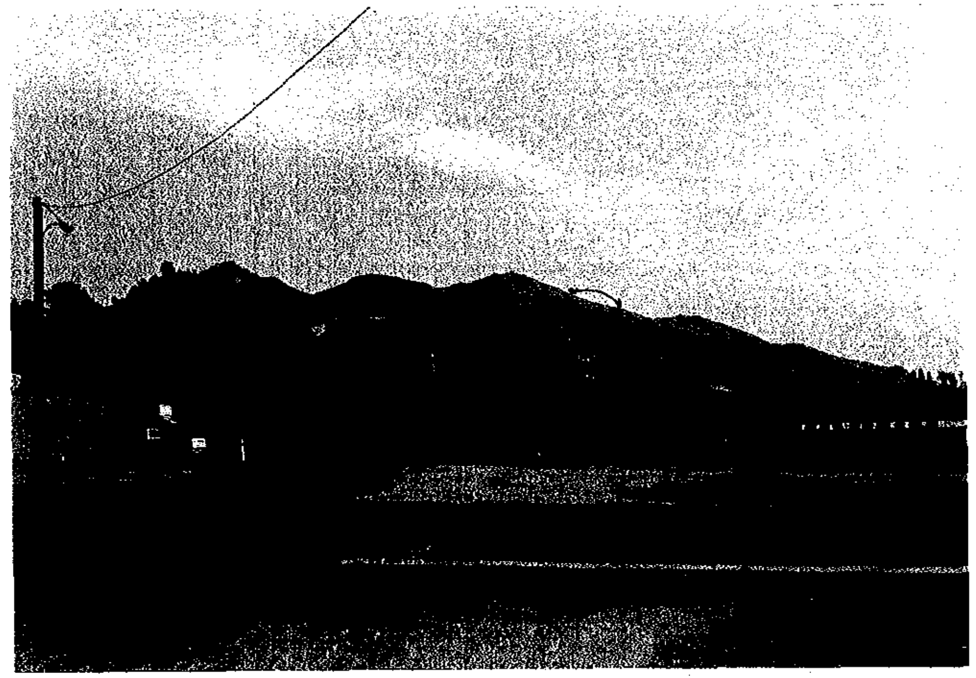
CORONA QUARRY
CALMAT CO.

FIGURE 22

VIEWS OF CORONA QUARRY FROM NORTH

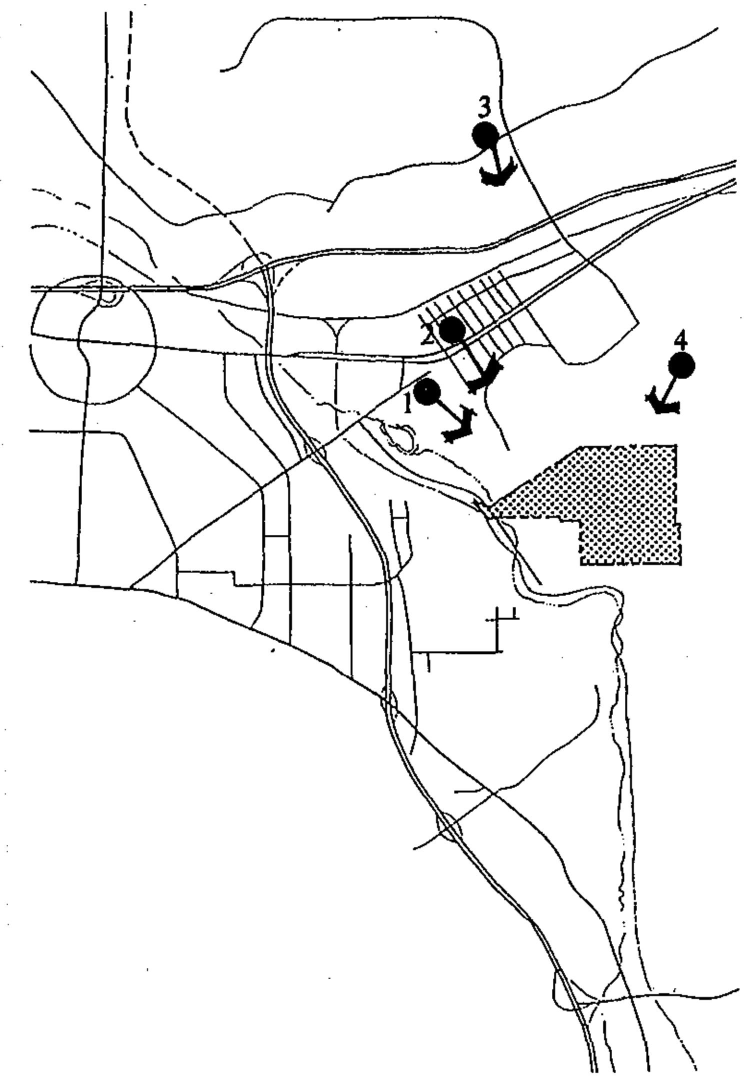


1 EAST END OF LESSON
MANUFACTURING

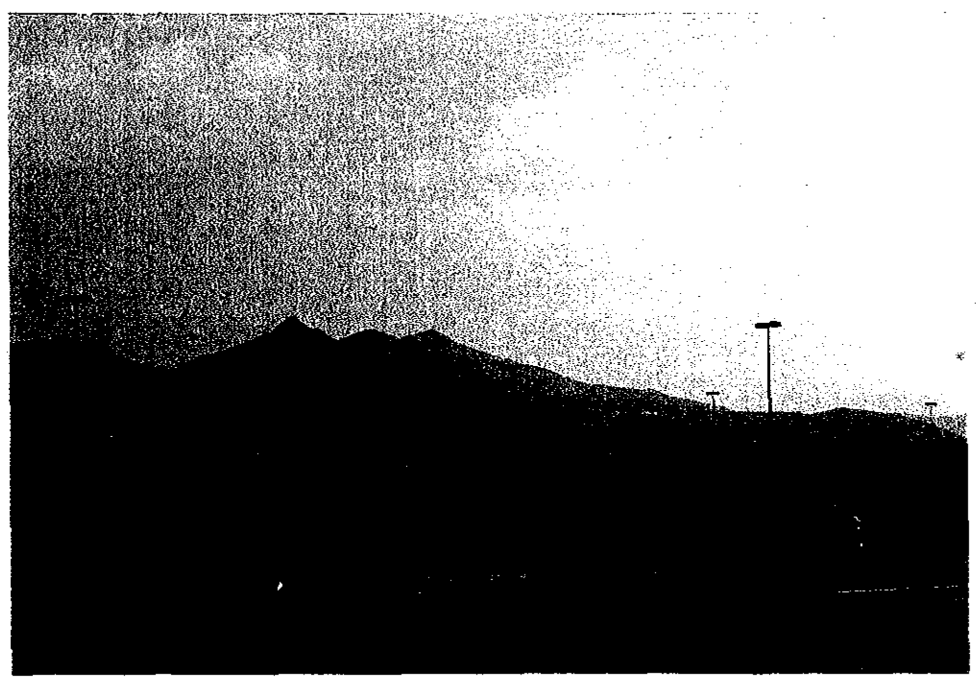


2 MAGNOLIA AT NEECE, HOME GARDENS
SINGLE-FAMILY RESIDENTIAL, MIXED COMMERCIAL

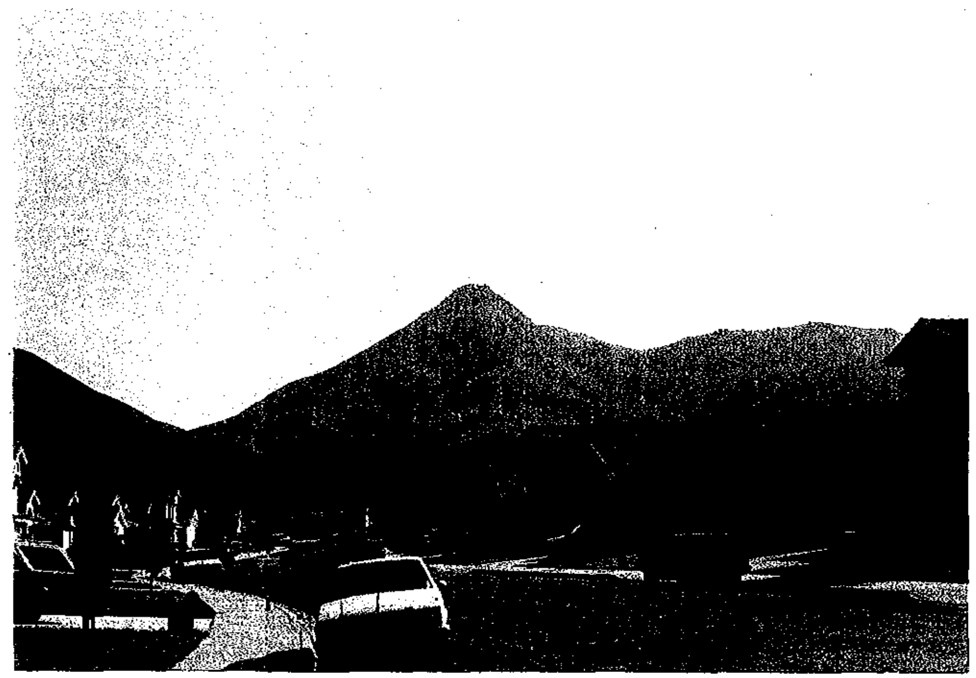
KEY MAP



3 MCKINLEY AT PROMENADE, CORONA HILLS
MULTI-FAMILY RESIDENTIAL (UNDER CONSTRUCTION)



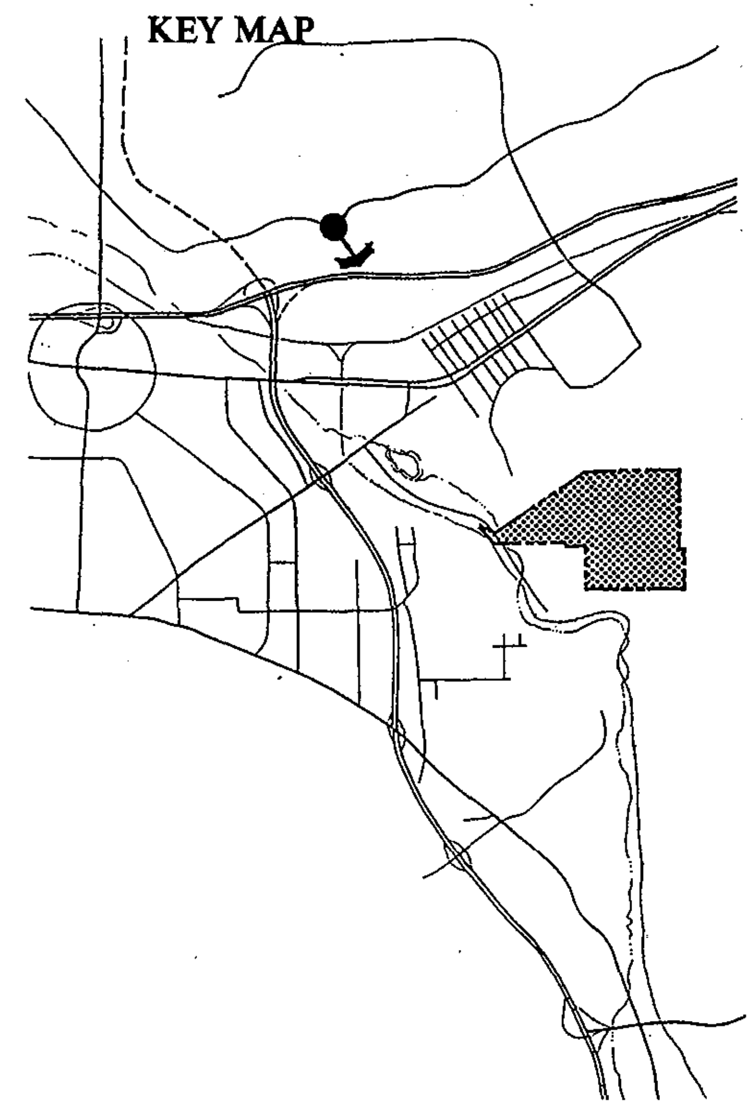
4 SPRING CREEK AT APRIL
SINGLE-FAMILY RESIDENTIAL



CORONA QUARRY
CALMAT CO.

FIGURE 23

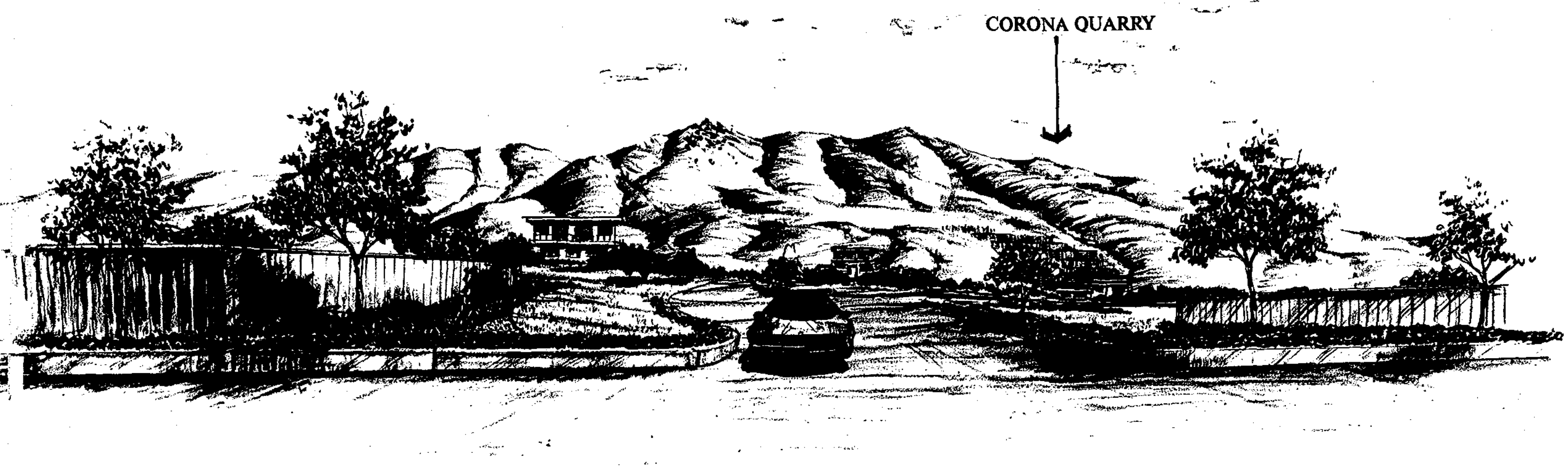
PRE-PROJECT VIEW
FROM CORONA HILLS



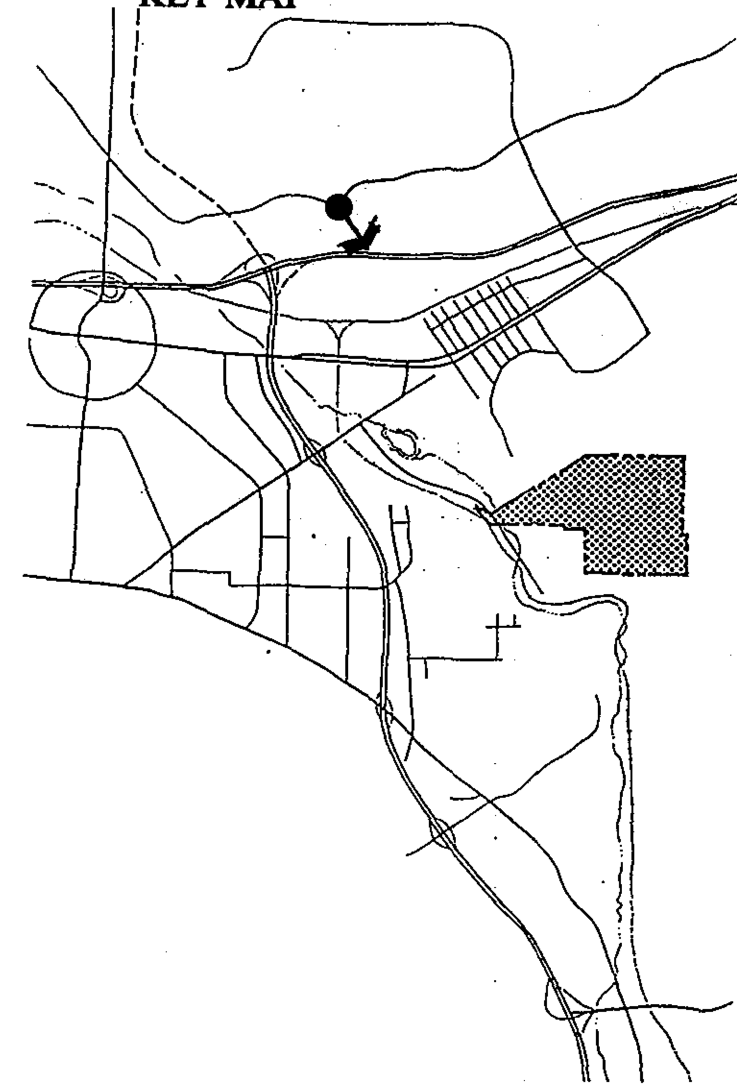
CORONA QUARRY
CALMAT CO.

FIGURE 24

MID-PROJECT VIEW FROM CORONA HILLS



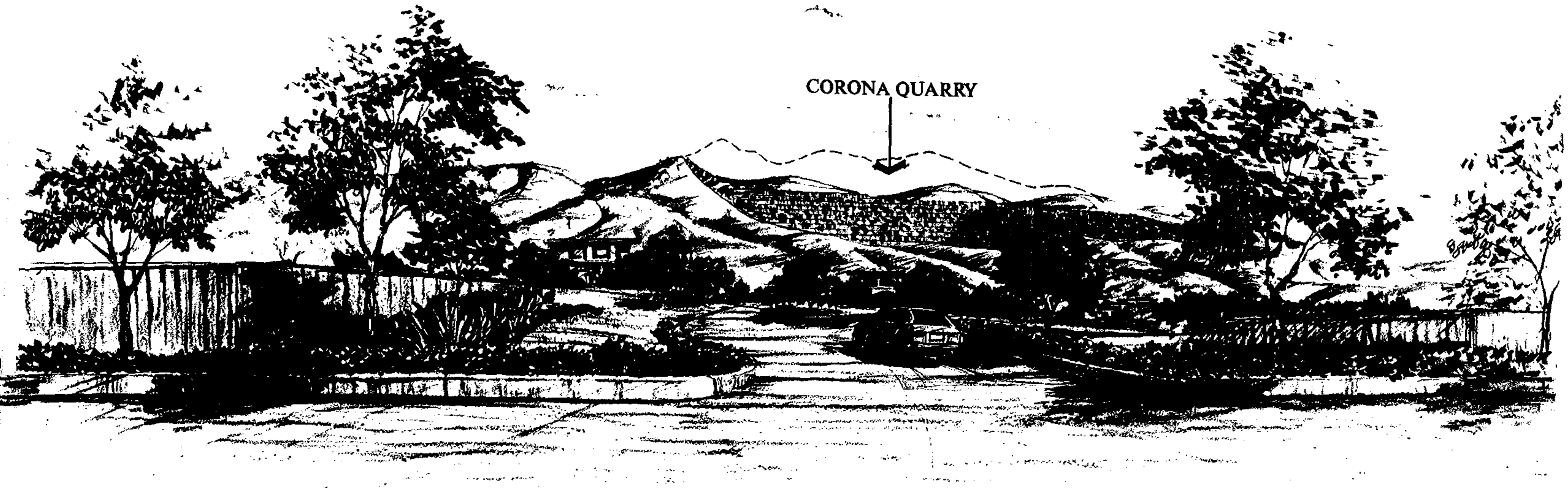
KEY MAP



CORONA QUARRY
CALMAT CO.

FIGURE 25

END-PROJECT VIEW FROM CORONA HILLS



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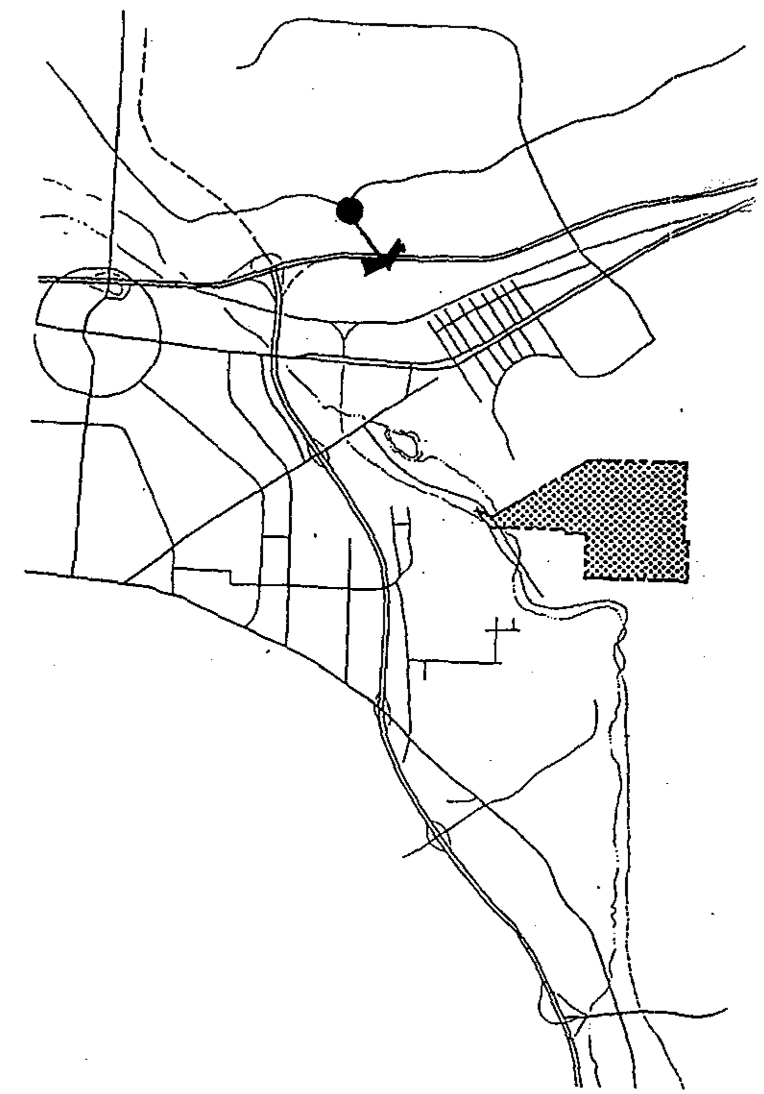
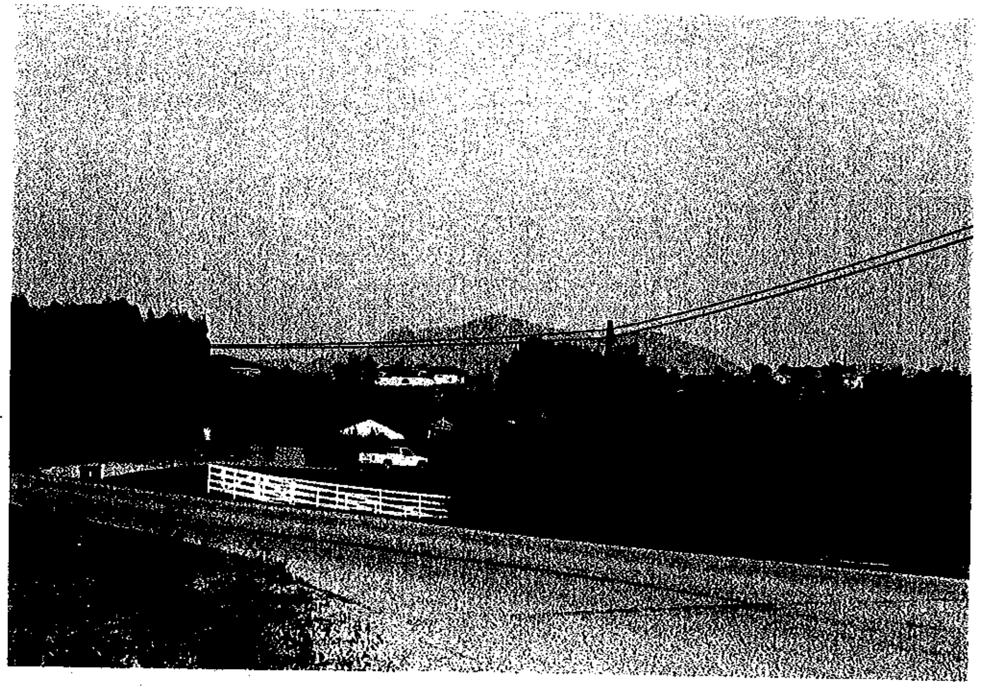
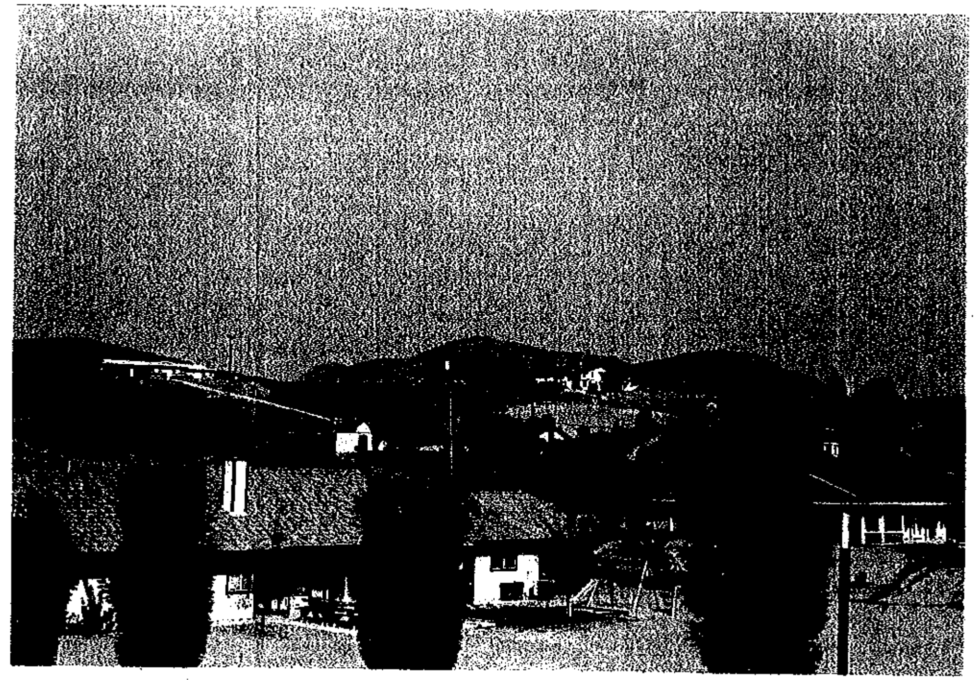


CORONA QUARRY
CALMAT CO.

VIEWS OF CORONA QUARRY FROM SOUTH



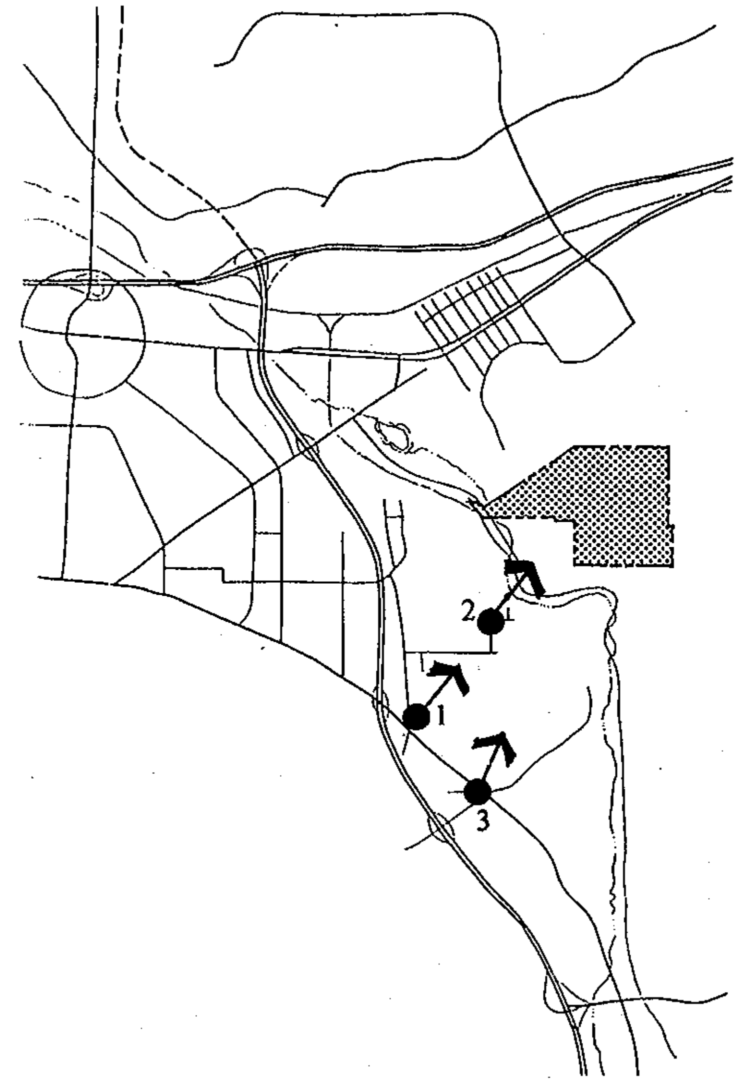
1 ONTARIO AT STATE
RURAL RESIDENTIAL



2 QUAIL AT WILDLIFE
RURAL RESIDENTIAL

3 ONTARIO AT RUDELL, EL CERRITO
RURAL COMMUNITY

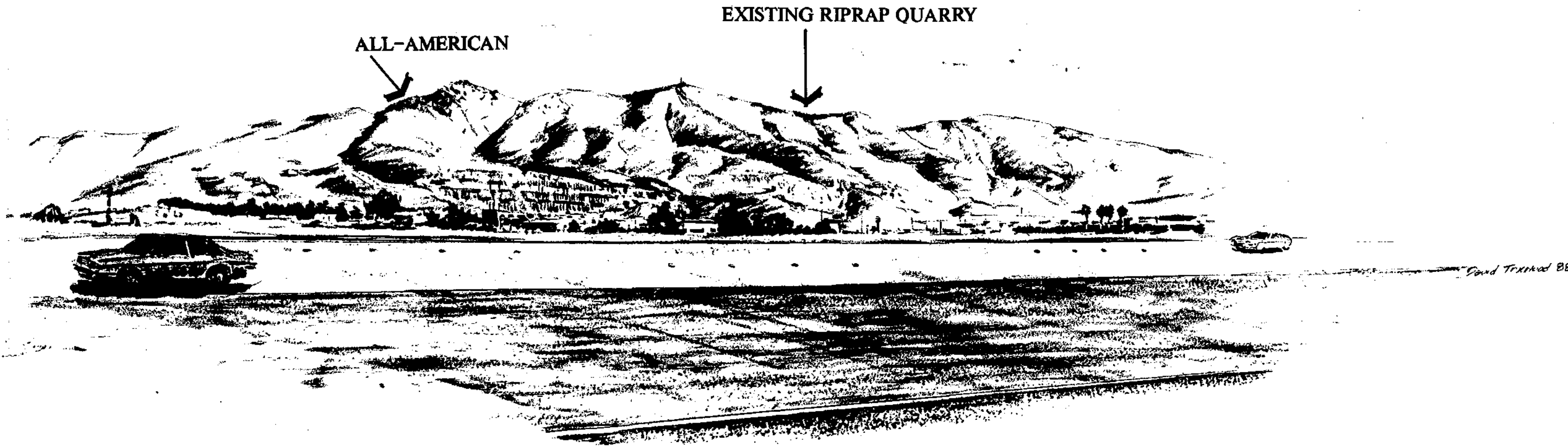
KEY MAP



CORONA QUARRY
CALMAT CO.

FIGURE 27

PRE-PROJECT VIEW FROM INTERCHANGE



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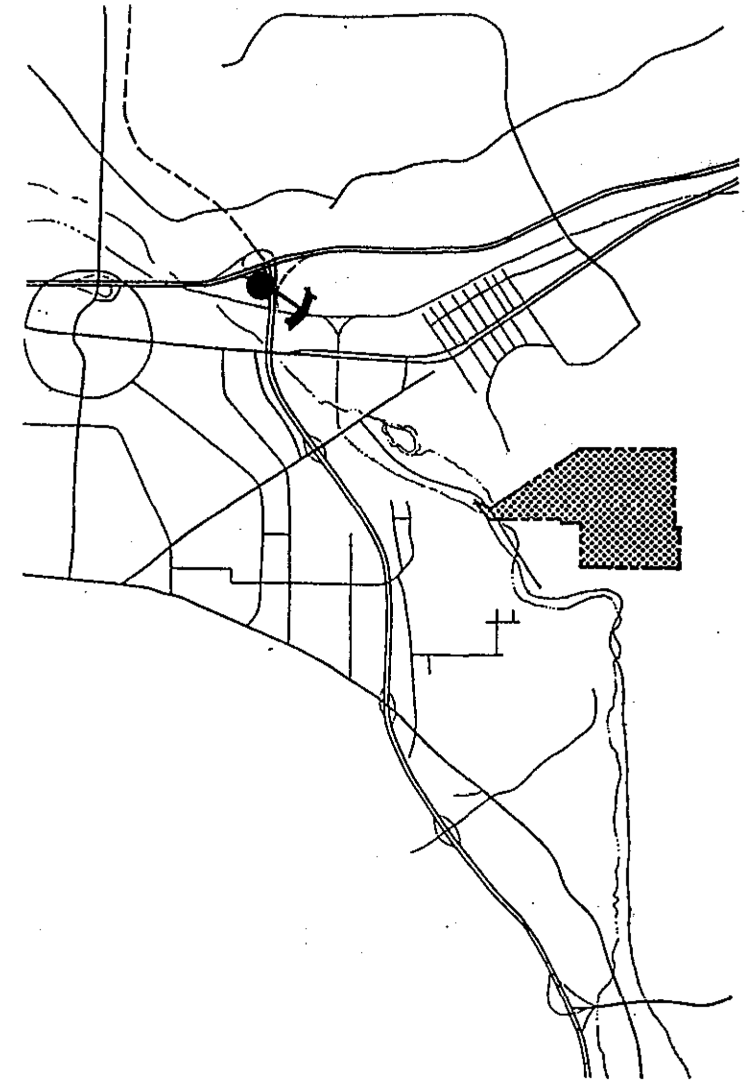
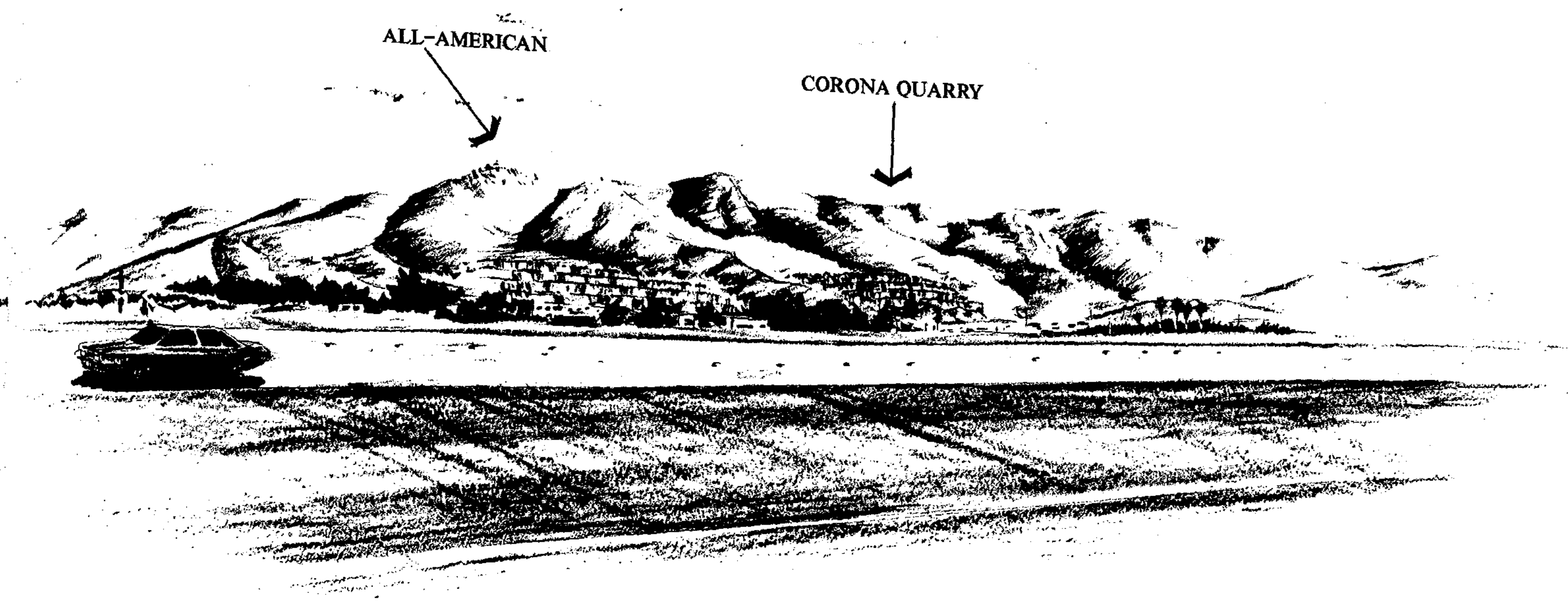
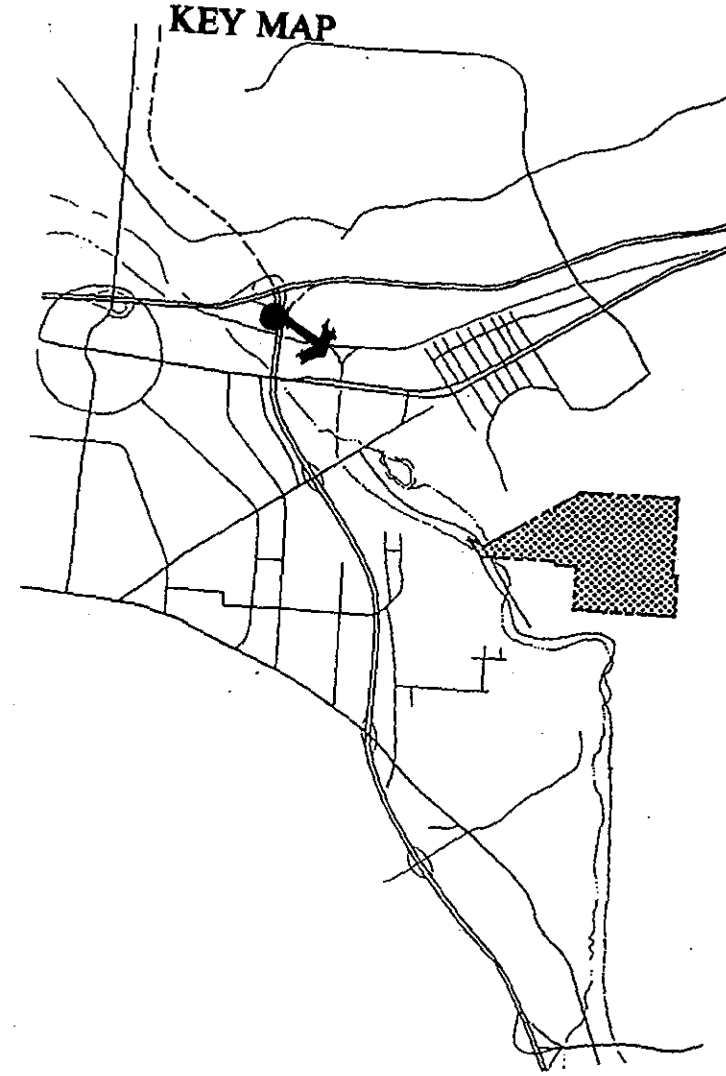


CORONA QUARRY
CALMAT CO.

FIGURE 28

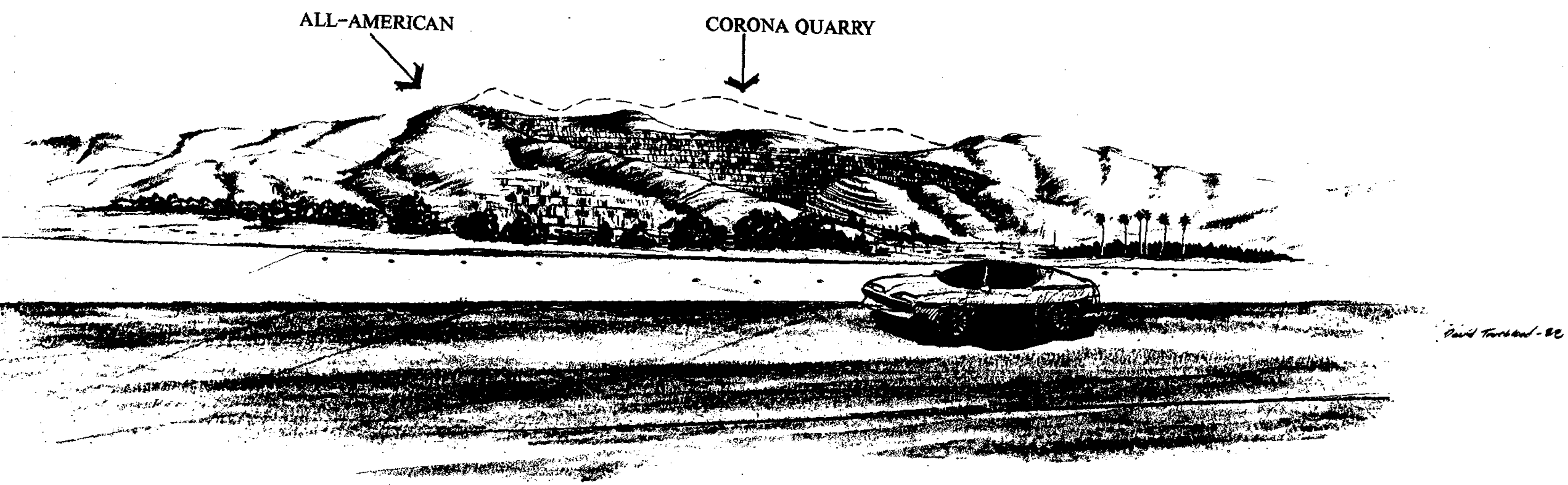
MID-PROJECT VIEW
FROM INTERCHANG



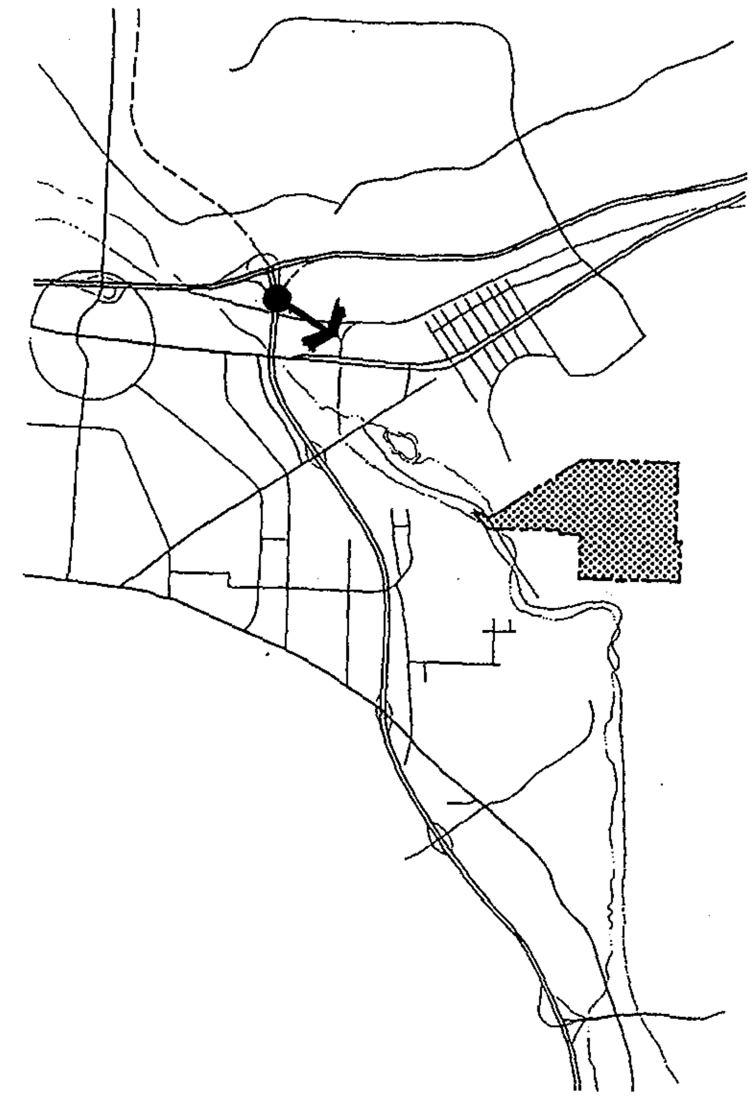


CORONA QUARRY
CALMAT CO.

END–PROJECT VIEW FROM INTERCHANGE



KEY MAP



CORONA QUARRY
CALMAT CO.
EMA

The Corona Quarry project is more than the mining itself. As required by the Surface Mining and Reclamation Act of 1975, all surface mines are required to formulate a reclamation plan which addresses the post-mining condition of the site. Again, restoration of the mined land, cliffs, rocks and other features, is unfeasible, if not impossible. Instead, rehabilitation of the site to an appropriate land use is the goal. The desire to reshape mined lands to approximate original topography must be tempered within practical limits, taking into consideration the need to increase the productive potential of mined lands. As illustrated in many of the previous figures, the present Corona Quarry site is rough, rocky, and nearly impassable. Through mining, formerly steep, impassable and rough topography will be modified. The resulting landform will allow a variety of post-mining uses which are at present impossible. (Section 2.2 discusses these potential uses.) Figures 5 to 7 illustrate how the site might be developed at some date in the future following the completion of mining. These perspectives are not meant to depict specific post-mining land uses. No firm or individual can realistically plan land uses for at least 75 years in the future. Rather, these exhibits demonstrate the potential of the reclaimed landform which will result from this project.

3.6.3 Mitigation Measures

It is impossible to fully mitigate the topographical alterations that will occur as a result of the Corona Quarry project. No structure, berm, or plant material can screen the elimination of a 1,625-foot peak. During mining, visual mitigation shall be limited to the use earth tone paints for the processing plant to lessen its impact, and the retention of vegetation along the western edge of the site, to help maintain a natural appearance near the site entrance. No intensive night lighting shall be permitted which could cast unnatural shadows or glare.

Aesthetic reclamation shall involve, at a minimum, the following, to achieve a more generally acceptable post-project visual character:

- *a.* *Removal of all mining equipment, processing plants and stockpiles, and the clearing of related debris.*
- *b.* *Restoration to a structurally stable final topography, minimizing geological hazards and facilitating natural drainage of surface waters.*
- *c.* *Contouring of mined terraces to produce more natural topographical faces by means of random rounding of edges and the interruption of ledges.*
- *d.* *Establishment of a permanent, self-perpetuating vegetative ecosystem to closely approximate the natural environment, through resoiling and revegetation, with monitoring and specific assurance mechanisms to guarantee successful completion to be provided by project proponent.*
- *e.* *Whenever possible, reclamation shall occur concurrently with mining. As one phase of the mining operation is completed the exposed cliff faces and ledges shall be reclaimed.*
- *f.* *When mining has been completed, the landform shall be such that a suitable post-reclamation land use is possible.*

3.7 TRAFFIC

3.7.1 Environmental Setting

Corona Quarry is accessed utilizing Magnolia Avenue, Cajalco Street, Interstate 15 and Route 91. Magnolia Avenue in the vicinity of Cajalco Street is an unimproved 2-lane roadway. In this area the street is operating near its design capacity. Near the I-15 Freeway, and as it approaches Sixth Street, Magnolia Avenue has been improved to a 4-lane divided roadway. These intersections of Magnolia Avenue at I-15 and Magnolia Avenue at Cajalco Street are currently operating at a "B" Level of Service or better during both the morning and evening peak hours. Magnolia Avenue is currently carrying approximately 11,200 vehicles per day.

Cajalco Street is a two-lane roadway which tees with Magnolia Avenue east of I-15. It is publicly maintained for about 1/4 mile south of Magnolia Avenue and privately maintained beyond that point. This road serves as an access roadway to the existing Fontana Paving aggregate quarry and asphalt hot plant to the south of the project site and for various industrial and construction-related facilities north of the Corona Quarry. It carries mostly heavy trucks and has an estimated daily volume of approximately 900 vehicles per day.

There are existing Atkinson, Topeka and Santa Fe railroad tracks which pass through the west end of the site. These tracks are currently not in use.

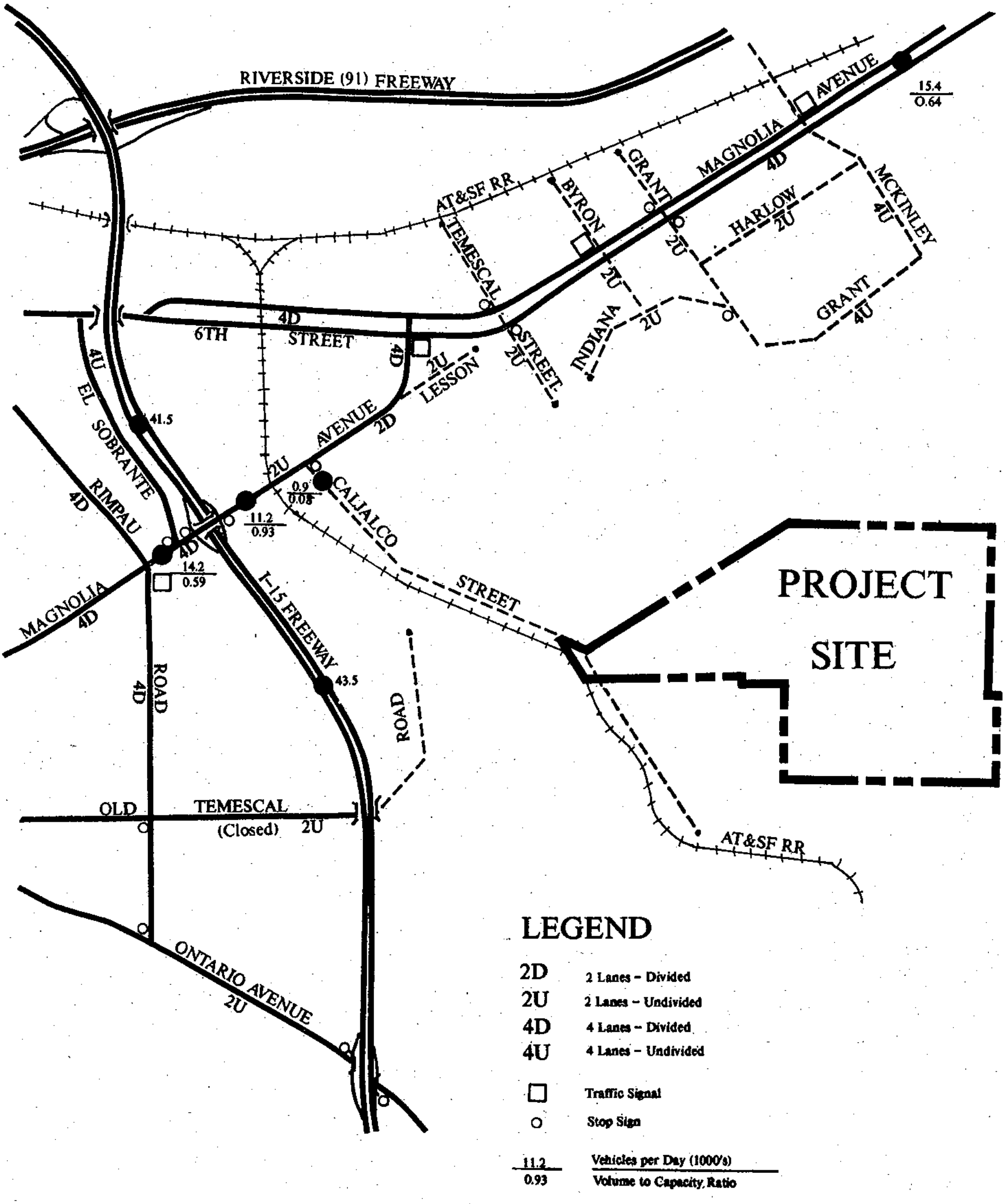
Figure 31 illustrates the existing traffic conditions in the vicinity of the subject site.

3.7.2 Potential Impacts

Corona Quarry will operate in two phases. During the initial phase, for approximately 5 to 10 years, a small, portable processing plant will be used until enough area is excavated on which to locate a permanent processing plant. During this phase approximately 300,000 to 2,000,000 tons of aggregate will be processed and transported off-site each year.

After the permanent processing plant is installed, 5 million tons or more of aggregates per year will be produced, or over 16,000 tons per day, until project completion. When fully operational, this activity projects a vehicular generation of 1,750 daily vehicle trips; 270 of these will occur during the morning peak hours and 50 will occur during the evening peak hours. The majority of the trips will occur during off-peak driving times.

Heavy trucks make up the majority of traffic generated by this site, with other light vehicles representing employees traveling to and from work. Table 3-10 details the type of vehicles which will be used to deliver the finished construction products from the site. Hours of operation and project-generated traffic typically begin prior to the morning peak traffic hour and end before the evening peak traffic hour, in support of off-site construction activities.



EXISTING TRAFFIC

CORONA QUARRY
CALMAT CO.

FIGURE 31

TABLE 3-10
CORONA QUARRY GENERATED DELIVERY VEHICLES

Type	*Maximum Length*	*Capacity*	*Gross Weight*	*Use*
Double-trailer bottom-dump	64 feet	26.50 tons	40.00 tons	Hauls loose aggregates
Semi, rear-dump	50 feet	20.15 tons	36.75 tons	Hauls loose aggregate and rip-rap
Single-unit 10-wheel dump	26 feet	14.50 tons	26.00 tons	Hauls loose aggregate and asphalt
Single trailer	61 feet	25.00 tons	40.00 tons	Hauls loose aggregate and asphalt
Ready-mix transit	40 feet	10 cu. yards	33.00 tons	Hauls ready-mixed concrete

When these projected vehicle trips are added to the existing traffic conditions, the 2-lane segment of Magnolia Avenue west of Cajalco Street will exceed its design capacity. All intersections within the vicinity of the Corona Quarry will operate at a "D" Level of Service or better without roadway improvements.

Cajalco Street will be adequate as a 2-lane roadway under the conditions generated by this project.

Figure 32 illustrates the existing traffic volumes and those which could be expected if the proposed project were to proceed.

The project proponent anticipates the possibility of using the existing railroad tracks for distribution of products at some time in the future. Conveyors would be used to transport materials over Cajalco Street to the small piece of property leased by CalMat and located along the railroad siding. Such a potential use would not begin until Phase II. The use of railroad transportation will decrease the number of truck trips needed to deliver aggregates to various markets. The feasibility and logistics of such a process will be investigated during Phase II of the project.

3.7.3 Mitigation Measures

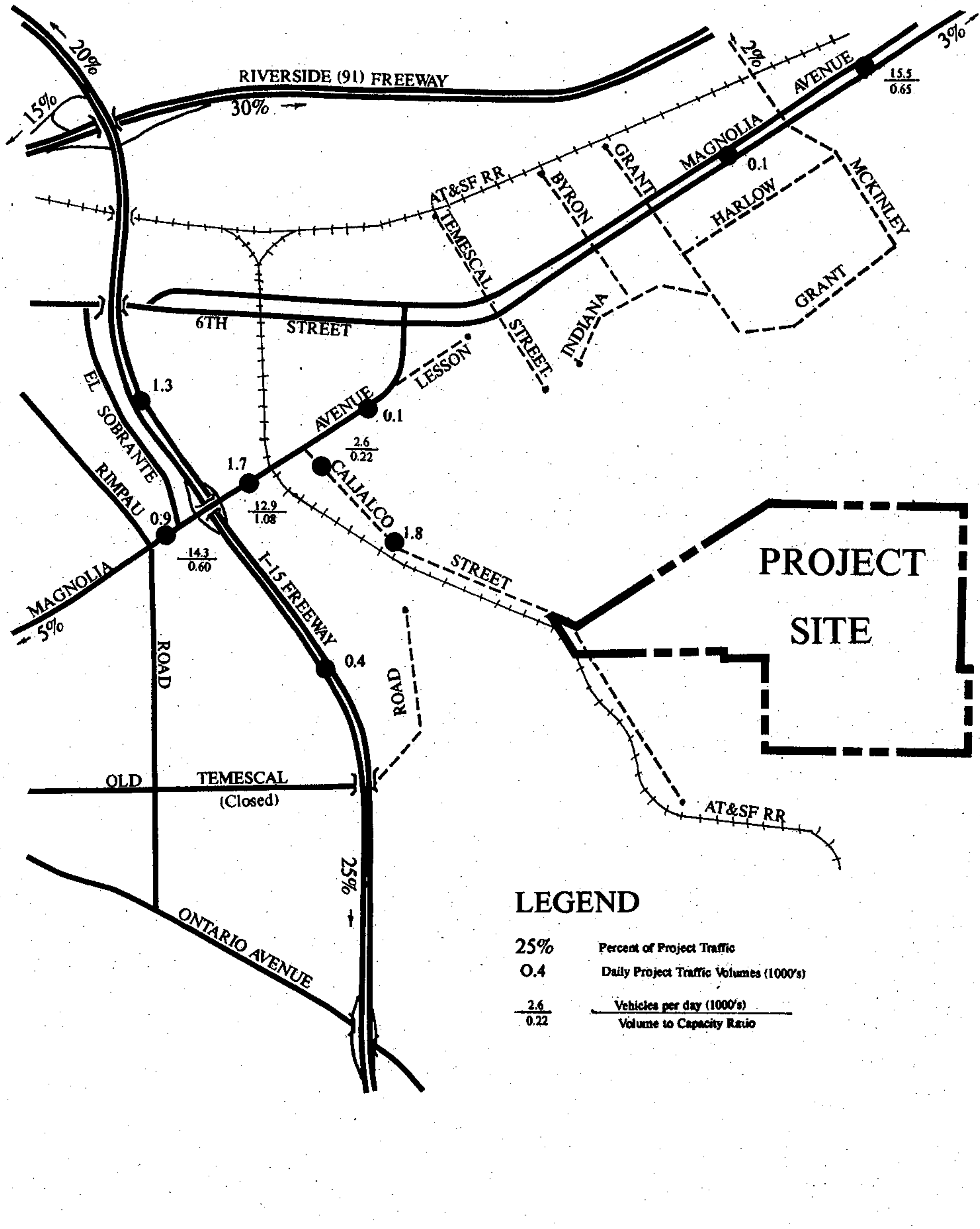
1. *Improvement of the existing 2-lane segment of Magnolia Avenue in the vicinity of Cajalco Street to a 4-lane divided roadway should be required when the plant production exceeds approximately 2,350,000 tons of aggregate per year. (This will occur sometime during Phase II.)*

2. *Although a traffic signal is not warranted at the intersection of Magnolia Avenue and Cajalco Street based on projected traffic volumes, other conditions may justify the installation of such a signal in the future. The operation of this intersection should be reviewed periodically by the County to determine if there is a need for a signal.*

3. *A high level of service along Magnolia Avenue should be maintained by restricting on-street parking and controlling roadway access.*

4. *Use of the existing railroad tracks shall be encouraged for the transportation of materials.*

5. *All applicable Riverside County Road Department ordinances shall be complied with.*



EXISTING PLUS PROJECT TRAFFIC

CORONA QUARRY

CALMAT CO.

FIGURE 32

3.8 PUBLIC SAFETY

Introduction

The ideal location for aggregate mines is in areas of unconsolidated material which only need to be dug out of the ground. However, such sites are not as readily available as they once were due to encroaching urbanization and depletion of existing aggregate mines. For this reason, the construction materials industry must seek resources in less easily excavated locations. Such a case exists at Corona Quarry. The removal of aggregate will necessitate the use of explosives. The blasting plan for Corona Quarry involves first drilling "blast holes." Explosives are loaded and detonated within these "blast holes." The rock is thereby fragmented sufficiently to allow it to be loaded and transported by traditional equipment such as haul units for transport to the crushing plant.

For the planned operation two factors are critical for efficient production: (1) the rock must be properly fragmented for handling and processing; and (2) the broken rock must be confined within a relatively small area to avoid losses and facilitate the recovery process.

The following is a description of the initial blasting plan for Corona Quarry. First, blasting holes four inches in diameter and 25 to 50 feet deep will be drilled. A series of 25 to 30 holes, drilled vertically downward, will be spaced along benches approximately 25 to 50 feet high. This schedule will allow for initial production and the development of roads and working benches. Further blasting plans will be developed in order to achieve the desired daily requirements, and to reflect physical conditions such as geology, weather and equipment availability.

3.8.1 Existing Conditions

The project site has a predominant westward facing exposure. Adjacent to the CalMat property, on the western side, are various industrial facilities, such as salvage yards, mining activities, and construction equipment storage. The BelAir housing development is less than three-quarters of a mile from the site, and is partially screened by topographic features. The I-15 Freeway is approximately three-quarters of a mile to the west. Another housing development is located on the west side of the freeway.

About one-half mile north of the site, within the City of Corona, is a housing development, also largely shielded from the quarry by topography. The east and south side of the site are mostly open space or active mining.

3.8.2 Potential Impacts

Because of the general orientation of the site and the principal working faces of the mine, the main impact of the blasting will be towards the west, and to a much lesser degree, to the north.

The release of energy from a quarry blast of the type that will be used at the Corona Quarry results in three basic effects: ground vibrations, noise, and dust.

Ground Vibrations: When a blast is detonated, most of the energy produced travels through the ground in the form of shock waves and gas pressure. If such vibrations are of sufficient intensity, they may cause structural damage. However, as they move through the earth they quickly expend energy and become weaker. It is anticipated that ground vibrations will not be significant and will not damage surrounding facilities or structures, or cause annoyance to anyone living or working in the area. Impact will be limited to a slight tactile vibration which may be experienced by persons contacting solid surfaces in the nearby residences.

Noise: The effects of noise, or air blast, are caused by compressive waves travelling through the atmosphere. Air blast from explosives can be produced by several mechanisms. Primarily it is the result of energy which is not confined in the ground and is allowed to escape into the atmosphere. The type of blasting anticipated for the Corona Quarry project will result is some releases of energy into the atmosphere. Such sound waves are greatly effected by environmental factors such as temperature inversions, reflection off of surfaces such as pit walls, and wind. Actual damage from air blast is uncommon. The effects noticed most often are rattling windows and startled neighbors. Occasionally, the air and ground waves arrive at a location at approximately the same time, magnifying the apparent intensity.

Dust: An explosive detonation creates a number of gasses, some of which are toxic. These include carbon monoxide and oxides of nitrogen. However, the atmosphere reduces their concentration to well below allowable limits almost immediately. Blasting in an open excavation such as the Corona Quarry presents no toxic concern to local vegetation, wildlife, or humans. The dust generated by a blast is composed of heavy particles of soil and rock which settle rapidly. In windy conditions this dust will naturally be carried downwind. Fine dusts, silica dust, and fibrous materials are of the airborne particulates of greatest concern to the public safety. Very small amounts of such substances (if any at all) will be produced by this operation.

The explosives used at Corona Quarry are proposed to be safe, efficient and specifically designed for this type of operation. The modern products used are highly controllable and manufactured to very close tolerances to provide adequate energy release without producing excessive results. The initiating devices are designed to provide the user with the capability of determining the precise quantity of explosives to be detonated within any time frame. They are designed to be confined within the blast holes to avoid excessive noise and produce maximum control.

3.8.3 Mitigation Measures

1. *All laws, regulations, and standards governing the transport, storage, handling, and use of hazardous explosives shall be observed, including those of the Federal Department of Transportation, the Bureau of Alcohol, Tobacco, and Fire Arms, the Occupational Safety and Health Administration, the Mine Safety and Health Administration, California Bureau of Mines, and other federal, state, and local agencies. Included among these are stipulations regarding the acceptable containers for storing explosives, vehicle safety around explosives, driver competence, methods of loading and unloading, safe routes for the transport of explosives, location and construction of storage facilities, quantities of explosives to be stored, security of storage facilities, required inspections, safe handling, and the like. Due to the nature of the material involved, personnel selected to handle explosives on- and off-site should be carefully chosen and fully trained. Only qualified, experienced, State-licensed blasting technicians shall be permitted to design, supervise and detonate explosions.*

2. *Accurate area and site specific weather data regarding temperature inversions and wind conditions should be obtained, with special attention to time-of-day conditions. Blasting should be scheduled to reflect these atmospheric conditions and avoid undue disturbances caused by wind diverted or inversion compressed air blast.*

3. *Initial blast designs should not exceed 2,000 pounds of explosives per 8 ms delay period. Seismic monitoring should be conducted in the nearby residential neighborhoods during these initial blasts to determine how far these limitations can be increased. However, at no time should explosive episodes result in Peak Particle Velocities exceeding one inch per second.*

4. *Holes should not be drilled close to an open bench face and sequential timing techniques should be used to provide direction and confinement of rock movement.*

5. *Explosives should not be loaded to the top of blast holes and rock chips or similar material should be loaded above the explosives column to reduce "fly rock."*

6. *Low energy explosives should be used to produce the desired results while reducing the visible effects of the blast.*

7. *Use down-the-hole initiation of explosive episodes, and avoid the use of high strength detonating cord.*

8. *Pay particular attention to weak zones within the rock formation which could cause excessive energy release and place non-explosive decks through these zones.*

9. *Provide sufficient time between adjacent holes to help prevent air blast reinforcement.*

10. *Just prior to the time of a blast, the site should be cleared of people, warning signals should be sounded and visual inspections should be made to be certain no unauthorized people are in the area. Following an explosive detonation the area should be inspected to insure that the blast proceeded as planned. Only after this inspection should the "all clear" signal be given.*

11. *The explosives used on-site shall be stored in small quantities on-site, under the conditions established by the Occupational Safety and Health Administration, and the Mining Safety and Health Administration.*

12. *Public access shall be limited by the use of barriers (fences, gates and locks) and "No Trespassing" signs. Chainlink fencing shall be used along the north, south and west boundaries. Along the eastern quarry face, which is less likely to experience public trespass due to the lack of access routes, 3-strand barbed wire fencing shall be used to deter public access. The posting of "No Trespassing" signs shall be in accordance with local and federal regulations.*

13. *The Riverside County Sheriff's office shall be kept informed of the blasting schedule on-site.*

3.9 FIRE HAZARDS

3.9.1 Existing Conditions

The proposed Corona Quarry site is located within an area designated by the County of Riverside to be a Hazardous Fire Area. The County defines these areas as hazardous due to many environmental factors including condition and quantity of surface vegetation, topography, existing water supply, availability of pressurized water systems, and proximity and response times of fire stations in the area. Generally, these areas designated as hazardous, are vulnerable to wildfire due to the build up of dry natural vegetation in the warmer seasons of summer and fall. Wildfires, compared to urban fires are hazardous in that they can destroy more acreage of natural open space and are more difficult to control, whereas urban fires are site specific, result from sources within a specific structure, and have, by law, more intensive protection due to the more prominent risk of loss of life and property.

The existing topography of the Corona Quarry site is greatly in excess of the County's criteria for areas subject to wildfires, except for approximately twenty-four acres located at the most westerly portion of the site. This section of the site is where the proposed processing structures are to be located. The remaining acreage is to be mined.

As discussed in Section 3.4, Vegetation and Wildlife, the entire site (with the exception of two identified riparian habitat locations in the Temescal Wash basin) is covered with slightly degraded non-native grass and coastal sage scrub plant. In times of extreme heat and low moisture these plant species become fire sensitive.

The proposed site is currently afforded fire protection from two fire stations. One, located approximately three miles to the northwest is operated by the U.S. Forestry Service, and the second, located next to the U.S. Forestry Service Station, is operated partially by volunteers through the Riverside County Fire Department. Both stations have a response time of approximately five (5) minutes to the site.

3.9.2 Potential Impacts

The implementation of the Corona Quarry operation, within a County designated fire hazard zone, will subject the proposed operation and improvements to possible fire damage, at least until the end of the projected first phase of operation, at which point it is projected that most of the site (the extraction area) will be cleared of all excess vegetation and brush. The expansion of the existing aggregate quarry will have minimal impact on the Fire Departments operations, in terms of requiring fire protection. (See Riverside County Fire Department letter dated August 30, 1988, Appendix 5.1.)

3.9.3 Mitigation Measures

Mining and processing does not typically create additional fire hazards. In fact, the clearing of brush from mined areas will tend to limit the spread of wildfires, much as an excavated fire break will. While there is little to indicate that the Corona Quarry will increase the possibility of fire, all normal precautions shall be taken to ensure the safety of on-site personnel and the general public. These measures shall include the following:

1. *All flammable materials shall be handled and stored in a safety-conscious manner. Smoking should not be allowed within the presence of such materials.*

2. *Blasting shall be accomplished by trained personnel with all precautions taken when handling explosive and flammable materials.*

3. *When working in vegetated areas, spark arrestors shall be used on all combustion equipment to prevent the threat of wildfires.*

4. *The site shall be subject to unannounced fire safety inspections to assure compliance with all applicable fire and safety codes. The site shall be made immediately accessible to credentialed County Fire personnel for all such inspections.*

4.0

MANDATORY CEQA TOPICS

4.0
Mandatory CEQA Topics

4.1 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts are generally defined as the combined effects of multiple development projects and/or the combined effects of various environmental impacts resulting from an individual project.

The western Riverside County area is experiencing a very rapid rate of urbanization. New residential and mixed-use development has occurred recently and is occurring or planned throughout the Corona area. These include the Corona Hills development to the north and the mixed uses in the eastern portion of the City of Corona.

Given the extent and availability of the aggregate resources in the Temescal Wash area, it is likely existing mining operations there will seek to expand and that others will seek to open new mines locally. Projections of urban growth in western Riverside and eastern Orange counties and declining sand and gravel reserves elsewhere will intensify this trend.

The cumulative effect of blasting episodes in the project area (by Corona Quarry, All-American, Santa Ana River Rock, and 3M) on the biotic resources is not expected to threaten their existence. This is based on the evidence that current blasting has not driven the Stephens kangaroo rat, a federally-listed endangered species, from the area, nor collapsed its burrow holes.

4.1.2 Air Quality

Air quality in the region of the proposed Corona Quarry is dependent on the regional air quality, as well as local pollutant sources. The primary concern in the Norco-Corona area is ozone. Ozone is a secondary pollutant, not directly emitted. It is the result of chemical reactions of other pollutants, mostly hydrocarbons and nitrogen dioxide, reacting with sunlight. The primary pollutants are produced in the greater Los Angeles/Orange County basin and transported to the Norco-Corona area by the prevailing on-shore winds. Since the pollutants are not produced locally they cannot be controlled locally.

Particulate levels in the area are due to natural sources, grading operations, and motor vehicles. The total suspended particulate (TSP) concentrations occasionally exceed the Federal primary standard. Uncontrolled the project would contribute to these levels considerably. However, controls by the South Coast Air Quality Management District will limit the the particulate levels. Additionally, the particulates emitted by the Corona Quarry project are larger than those which usually are of concern for local/regional air quality. The larger particles quickly fall to the ground, either on the site, or nearby, and do not remain in the air long enough to register as part of the TSP.

Grading operations, as part of development, are responsible for the greatest amount of particulate matter in the local air. Although individual sources are temporary, the continued growth in the area translates into a continuous air quality problem. At the present time the particulate concentrations are usually below the established standards, but increased development will exacerbate the problem.

Corona Quarry would only be one of several aggregate quarries in the greater Corona area. Productions levels for these existing quarries are not public knowledge, but taken as a whole these operations contribute significantly to the air pollutants in the area, especially with respect to particulates.

4.1.3 Biological Resources

The proposed project will add to the continued loss of coastal scrub habitat, which in turn will negatively contribute to the effects on faunal species, such as black-tailed gnatcatchers and Stephens kangaroo rat. The loss of these habitats is not technically permanent -- reclamation could restore them. But since restoration of these habitats is so far in the future the losses must be considered permanent.

The project will also add to the regional loss of foraging habitat for the golden eagle and other raptors.

4.1.4 Aesthetics

Increased urbanization in the western Riverside region, along with the proposed mining project, will cumulatively alter the visual character of the project vicinity. The proposed project will contribute to this change to the extent that landform alterations, plant equipment and storage piles will be visible by nearby residents and travelers. Ultimately, the plant equipment and storage piles will be removed, but the landform changes are irreversible. The proposed project could conceivably lead to more intensive mining by existing operators which could lead to even more severe visual effects.

4.1.5 Traffic

Project-generated truck trips will decrease the level of service on Magnolia Avenue. Housing development in the area, along with new commercial and industrial facilities along Magnolia and 6th Street will also impact this avenue. The two-lane portion of this roadway will need to be widened to four lanes to maintain an adequate level of service when plant production exceeds 2,350,000 tons of aggregate per year, or when other local events increase volumes and decrease levels of service accordingly.

4.2 UNAVOIDABLE ADVERSE IMPACTS

The only project-related impacts considered to be both unavoidable and adverse in nature are impacts upon biological and aesthetic resources.

Project implementation will destroy vegetation and disturb wildlife habitat during the course of the mining operations. Although revegetation will occur pursuant to the proposed reclamation plan, these measures may be implemented too late to contribute to the preservation of sensitive species such as the golden eagle, black-tailed gnatcatcher and Stephens kangaroo rat.

Aesthetic alterations are unavoidable and no mitigation efforts will disguise the significant topographical changes. These alterations will be slow and incremental for the most part, but the peaks will eventually disappear and will be replaced with a steep-sided pit. Reclamation will provide a site suitable for more aesthetically pleasing land uses, but this will not occur for at least 75 years. The following list suggests some possible post-mining land uses, along with examples of successful reclamation implementation for each:

o	High-tech Industrial Park	White Rock Development Sacramento
o	Recreational Facility	Holme-Pierrepont, England
o	Research and Development Facility	Corby New Town, England
o	Experimental Agriculture Facility	Bush Farm, England
o	Water Storage Reservoir	Anaheim Lake, California
o	High-amenity Housing	Coldspring, Washington, D.C.
o	"Land Art" (earth sculpture)	Great Salt Lake, Utah
o	Mining Museum	Beamish Open Air Museum England
o	Theme Park	Thorpe Park London, England
o	Botanical Gardens	Butchart Gardens Victoria, Canada
o	Horticultural Show Site	Hamm, West Germany
o	Horse-racing Track	Heerlen, Holland
o	Hotel, International Tennis Center	Larkspur, California

(Table 1-2 provides a summary of all project impacts, mitigation measures and the level of significance of the impacts after mitigation.)

4.3 ALTERNATIVES TO THE PROPOSED PROJECT

Section 15126(d) of the *Guidelines for Implementation of the California Environmental Quality Act (CEQA)* requires a discussion of reasonable alternatives to the proposed project or to the location of the project. The key consideration is the identification of an alternative or alternatives that allow for the attainment of project objectives while reducing the degree of adverse environmental impacts. An Environmental Impact Report need not consider an alternative whose implementation is remote and speculative. The alternatives addressed in this EIR include a "No Project" scenario, an operational modification alternative, and the possibility of conducting similar operations at a different location.

4.3.1 No Project

Under the No Project alternative, the Corona Quarry site would not be used for aggregate mining and processing activities, beyond what is currently allowed under the existing use permit No. M3-269 and reclamation plan, No. 117.

This alternative would limit the alterations to the existing character of the proposed project site and would avoid most of the localized environmental impacts associated with the proposed project.

If it is not possible to produce construction aggregates at the project site, it will be necessary to expand production at existing mines, permit other new mines, or import aggregate from further outside the market area to meet the anticipated demand for these products within the western Riverside and eastern Orange counties. If other mines are expanded or initiated many of the same impacts caused by this site will simply be relocated. The importation of aggregate from other areas would involve adverse effects related to increased vehicle miles traveled, such as increased air pollutant emissions and greater fuel consumption. Further, increased transportation costs would result in higher construction costs. Depending on various local conditions, the cost of aggregate resources is doubled with every 20 to 50 miles that such resources are transported.

The No Project alternative would not allow for the utilization of a county and state identified mineral resource and would limit the availability of construction aggregates in western Riverside and eastern Orange counties.

4.3.2 Operational Modifications

Reduced Project Size and Duration - Phase I Only: Under this alternative, mining operation would be limited to the Phase One portion of the proposed project. The eastern portion of the site would remain undisturbed. This mining operation would take place over the next 10 years. A temporary processing plant would be located on-site. The mined areas would be reclaimed by the revegetation of slopes and the removal of equipment and mining-related hazards.

Potential environmental impacts resulting from implementation of this alternative would be similar to the proposed project, but to a more limited degree. Air quality, noise and traffic impacts would be similar, but would impact the region over a shorter period of time. The impact on biological resources would be reduced, in that lesser amounts of coastal sage habitat would be removed. Much of this area has already been disturbed by permitted, on-going riprap mining.

Aesthetic impacts would be lessened by the Reduced Project Size and Duration alternative. The upper portions of the site would not be mined and, thus, the higher peaks would be left intact. The on-site processing plant would be smaller, and would be removed at an earlier date, but would still be visible from surrounding residential areas.

On the other hand, limiting the amount of aggregates mined from the site would require that the demand for this resource be made up by expanding other mines in the area, permitting the development of other mines in the area, or importing aggregates from outside the region. Thus, other impacts, such as those associated with the No Project alternative, would likely occur.

Reduced Project Size and Duration - 20 Year Plan: Under this alternative the mining would progress on-site in a generally west-to-east sequence, progressing for only about 20 years and only through the western half of Section 33. The eastern half of Section 33 would remain undisturbed. Processing facilities on-site would consist of some temporary and some more permanent equipment. The mined areas would be reclaimed by the revegetation of slopes and the removal of all equpment and mining related hazards.

Potential environmental impacts resulting from the implementation of this alternative would be similar to the proposed project, but on a slightly more limited scale. Air quality, noise and traffic impacts would be nearly the same, but for a shorter time span. The impact on biological resources would be slightly reduced since the eastern half of Section 33 would not be disturbed.

Aesthetic impacts are not as easy to quantify. It could be said that this alternative would create greater aesthetic impact, since the final topography would consist of an exposed, relatively steep westward-oriented face, rather than the depression left behind by the proposed project. It would be more difficult to reclaim such a face to a natural-looking landform than it would be for the proposed project.

Again, limiting the amount of aggregates mined from the site would require that the demand for this resource be made up elsewhere. This might require disturbing other sites, or importing aggregates at greater economic and environmental cost.

Plant Site Relocation: This alternative involves establishing the proposed plant site at another location, off-site. The mining operation would be similar to the proposed project, but processing on-site would be limited to some crushing and sorting. Mined aggregates would be transported to concrete batch plants and asphalt hot plants located elsewhere.

This alternative would cause impacts very similar to the proposed project. The aesthetic impacts would be slightly lessened by the reduced plant size. However, the major visual impact, the landform alterations, would not change. The relocated plant may also cause visual impacts at its new location.

Increased traffic impacts, with resulting air and noise impacts, may be experience with the Plant Site Relocation alternative due to the necessity to transport material to another plant site for processing. This could also result in increased product costs to the consumer. The alternative plant site may also result in site-specific environmental impacts.

4.3.3 Relocation to an Alternative Site

This alternative would involve conducting aggregate mining and processing activities at another location within an MRZ-2 Zone in the Temescal Valley-Orange County Production-Consumption (P-C) Region. (Locating such a production facility near to the consumption region is important because transportation costs resulting from greater distances between mines and markets would be prohibitive.) Urban expansion into potential sand and gravel is reducing the available extraction possibilities. During the initial project analyses all other options except the project site were eliminated due to environmental, economic, or logistical factors. Both alluvial and hardrock sites were investigated. The following were the primary regions analyzed:

Elsinore Trough: Alluvial deposits consisting from granodiorite, with gravel fractions of 30 to 65 percent. This deposit is estimated to be about 600 feet thick. However, nearly the entire reserve is currently under lease.

Temescal Wash: Both hardrock and alluvial resources were studied at various locations along the wash. Downstream from the proposed project the quality of aggregates decreases. Most of the sites investigated were eliminated due to environmental constraints (riparian habitats) or difficulties regarding access.

Hemet and Perris: Several sites were analyzed, but the distance from the Orange County market area weighed against them in this instance.

CalMat knows of no other site which combines the quality and quantity of aggregates available for mining at the Corona Quarry location, the relative ease of access, the proximity to market areas, and the relatively minor environmental constraints.

A variation of this alternative would entail relocating the mining of aggregates to several smaller sites. However, the cumulative environmental impacts of the several would likely be greater than those of the proposed project or relocation to one large site which would probably be further from the market.

4.4 GROWTH INDUCING IMPACT OF THE PROPOSED PROJECT

The project site is located in one of the fastest growing regions in the nation. The strong regional economy and its resulting high rate of growth will continue to create demands for construction aggregates. Thus, the project will not induce growth, but rather will serve more to accommodate growth, possibly in a more environmentally sensitive manner than if aggregates are mined further away and transported into the area.

The operation of an aggregate mine and the related processing plants does not generate a large amount of jobs. The few personnel needed to operate this facility would likely be drawn from the local labor force and would therefore not generate significant growth. (Approximately 33 jobs will be generated by Phase I, and about 61 by Phase II.)

4.5 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The proposed project represents a long-term activity in that mining and processing will take place over the next 75 years, at a minimum. Following mining, the reclaimed landform would be suitable for a variety of urban and non-urban uses. The ultimate use of this land is impossible to predict at this time.

The proposed project will enhance the long-term economic productivity of western Riverside County for two reasons. First, it comprises the utilization of aggregate resources within a designated area of "Regionally Significant Construction Aggregate Resources" that does not pose significant conflicts with urban uses. Second, the proposed project will provide a readily available supply of construction aggregate for one of the nation's fastest growing regions. The importation of a comparable amount of aggregate from further outside of the region would result in substantially higher construction costs than would ultimately be borne by homebuyers and renters, and the government (which is a major consumer of aggregates, directly and indirectly).

With respect to biological productivity, the planned reclamation of the project site would allow for the re-establishment of the natural biological communities, if such a strategy is desirable at that time. This is unlike various forms of urban development that would preclude revegetation.

4.6 IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF ENERGY SUPPLIES AND OTHER RESOURCES SHOULD THE PROJECT BE IMPLEMENTED

The project site, and most of the surrounding property, is undeveloped land, much of which has been disturbed by prior mining activities. Implementation of the proposed aggregate extraction and processing operation will result in a loss of some existing flora and fauna populations. The proposed reclamation provides for revegetation of the site with indigenous species. However, this revegetation will take place many decades from now, and how successful it will be cannot be predicted. Hence, the disturbance associated with mining activities could result in the long-term loss of biological resources.

The project will result in substantial long-term and irreversible modification of site topography and associated visual aesthetics.

The proposed project will result in the consumption of water resources, though much of the water used in processing will be recycled. Non-renewable fossil fuels will be used throughout the life of the project, though the amount of these losses will not be significant. Alternative sources of aggregates would also use water, electricity and fuels.

Finally, implementation of the Corona Quarry project is expected to commit approximately 400 million tons of aggregates for use as construction material. The commitment of these resources is irreversible, but it is not regarded as an adverse impact given the demand for such resources to accommodate the projected growth in the Temescal Valley-Orange County Production-Consumption (P-C) Region.

4.7 GENERAL PLAN CONSISTENCY

4.7.1 Land Use Element

Land use category designations on individual parcels of land within the jurisdiction of Riverside County are determined through the Land Use Determination System, utilizing the County's land use policies in conjunction with the General Plan diagrams. The first step of the Land Use Determination System involves the review of the Open Space and Conservation Map. The Corona Quarry site is designated as a Mineral Resource area on the this map. Such areas require careful and efficient development to prevent careless exploitation and uncontrolled urbanization. Development on or adjacent to mineral lands designated on the Open Space and Conservation Map as Mineral Resource areas must be compatible with mining uses. [17] Resource development and associated uses, such as the project, is permitted on such lands. Large lot rural development (at least 10 acres), extensive industrial uses, recreation, silviculture, grazing and open space are also considered compatible. The proposed project is consistent with this general plan policy.

The second step of the Land Use Determination System is a review of the Composite Hazards Map, the Composite Resources Map, and potential noise impacts. Portions of the project site are designated as the following:

- Mountainous areas and major scenic peaks
- 100-year floodplains
- Fire hazard areas
- Rare, endangered, threatened species ranges

Mountainous areas are those of more than 10 acres with slopes greater than 25%. The permitted land uses for such regions include open space, limited recreational uses, limited single-family residential, landfills, governmental uses, and compatible resource development or associated uses. The minimum lot size in Mountainous areas is usually 10 acres. The Corona Quarry project is consistent with this general plan policy.

The proposed project is within the 100-year floodplain of the Temescal Wash. Construction of structures within this floodplain are not permitted. No land is to be graded in the areas designated as floodways, except if such grading will not result in any increase in flood levels during a 100-year flood discharge. Activities associated with the proposed project will not impact the 100-year floodplain or floodway, except to reinforce the existing culverts and crossing. The project is consistent with this general plan policy.

Development within a fire hazard area is required to mitigate such hazards, by use of fire retardant building materials and fire protection improvements. The proposed project with make use of fire retardant materials for all equipment and structures, and fire protection improvements, such as the use of spark arrestors on mining equipment and the location of fire suppression equipment on-site shall be incorporated into the project. Additionally, the clearing of the majority of vegetation shall act to suppress wildfires. The Corona Quarry project is consistent with this general plan policy.

The Corona Quarry project is located partially within the historical range of the Stephens kangaroo rat, which, in 1988, was designated by both the federal and state governments as an endangered species. At the time of the drafting of this Environmental Impact Report, a program for the preservation of this species is being formulated. The boundaries of the historical habitat areas and species preserve sites are yet to be determined. If the Corona Quarry site is included within either of these areas, the project proponent will conform with whatever measures required by applicable ordinances.

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[17] Riverside County, *Comprehensive General Plan*, Second Edition, December 31, 1986, p. 401.

The next step in the Land Use Determination System utilizes the Land Use Planning Area Profiles. A land use planning area is a geographic subunit of Riverside County. The Corona Quarry site is located in the Riverside/Corona/Norco Land Use Planning Area. The Riverside County General Plan specifically encourages mining land uses in the Temescal Valley portion of Riverside/Corona/Norco. The proposed project is consistent with this general plan policy.

The fourth step of the Land Use Determination System is a review of the Land Use Element's standards and locational policies for land use categories and specific land uses. The Corona Quarry property is not located within any specific community plan area. No land use category or specific land use has been designated for the site.

4.7.4 Environmental Hazards and Resources Element

Slopes and Erosion: The Riverside County General Plan states that development in hillside areas (slopes of 25% or greater) should be designed to follow or flow with the natural contours of the site. Ridgeline, canyon edges and hilltop development is discouraged. The Corona Quarry project would cause significant alteration of scenic peaks and ridgelines. No mitigation of such an impact is possible. The proposed project is inconsistent with this general plan policy.

Noise: High traffic volumes, high truck traffic, heavy equipment operation, and blasting are noise emitters identified by the Riverside County General Plan as being associated with mineral extraction. However, the remoteness of the proposed Corona Quarry from residential and other noise-sensitive land uses will prevent adverse noise impacts from the project. The project is consistent with the general plan noise policies.

Air Quality: Major projects, such as the proposed quarry, are required to contribute to the mitigation of adverse air quality impacts. The Corona Quarry will be required to obtain and abide by permits from the South Coast Air Quality Management District. In doing so the project will be consistent with the general plan air quality policies.

Water Quality: Water quality impacts which might be associated with the Corona Quarry project included those generated by erosion-sedimentation problems. These impacts will be mitigated on-site through the use of retention basins and sediment traps. The result will be a project which is consistent with the water quality policies of the general plan.

Hazardous Materials and Wastes: The proposed Corona Quarry will used small amount of hazardous materials in the processing of aggregates. Such uses are allowable in the zones designated for this site. The public will not be at risk from the use and storage of such materials. All appropriate permits will be obtained and abided by. This is consistent with the general plan hazardous materials policies.

Scenic Highways: The Corona Quarry site is visible from Interstate 15, an Eligible State Scenic Highway on the State Master Plan. However, the Riverside County General Plan identifies the portion of the route along which the project is to be located as being already heavily impacted by extractive resource operations. The County does not consider this portion of the route a desirable State Scenic Highway and is recommending its deletion from the State Master Plan. Thus, the project is consistent with general plan policies.

4.8 EFFECTS NOT FOUND TO BE SIGNIFICANT

4.8.1 Hydrology

Temescal Wash crosses the project site, and a portion of the property is located within the 100-year floodplain and dam inundation area for Lake Mathews. However, the activities proposed will avoid locations within the floodway or floodplain, and no adverse impacts are anticipated to drainage patterns, groundwater or surface water quality or quantity. Erosion is not considered to be a significant problem on-site due to the lack of easily eroded material.

4.8.2 Noise and Vibration

The noise levels produced by the proposed Corona Quarry operations on-site will not adversely impact the nearest residential land uses. Noise from the mining and processing operations will not be audible or will be barely discernible off-site. Off-site traffic produced by the project will not raise the noise levels on the access routes beyond the "Normally Acceptable" level.

The vibration resulting from the proposed blasting activity on-site will be less than .005 g's (multiples of acceleration) at the nearest home. This level is not considered to be significant for a once-a-day event. The amount of vibration produced is less than can be noticed by the body, and only discernible as a small sense-of-touch vibration if touching an affected surface.

4.8.3 Air Quality

Compliance with SCAQMD Rules and Regulations, and the avoidance of blasting and use of additional wetting of graded surfaces during unusual east-to-west wind events will mitigate air quality impacts to a level of insignificance.

4.8.4 Cultural, Historical and Prehistorical Resources

No cultural, historical and prehistorical resources were discovered on-site, no impact will be precipitated by the proposed project.

4.8.5 Public Safety

Compliance with all applicable laws, regulations, and standards governing blasting and related activities will insure that the safety of on-site employees and off-site residents is protected at all times. Vibration levels off-site caused by blasting will be barely noticeable, as explained above (Section 4.7.2.).

4.8.6 Fire Hazards

Although the site is located in an area identified by the County of Riverside as a Hazardous Fire Area, the County Fire Department does not anticipate any additional impact on their ability to protect against wildfires. Since the site will be cleared of vegetation as part of the proposed project, fire dangers will actually be diminished.

4.9 MONITORING OF MITIGATION MEASURES

The following section identifies the persons or agencies responsible for monitoring the various methods of mitigation for compliance.

Hydrology and Drainage: The project proponent shall be responsible for monitoring the condition of surface and groundwater, and insuring that neither is contaminated or unnecessarily diverted.

The Army Corps of Engineers and the California Department of Fish and Game will be responsible for reviewing the project and insuring that all necessary permits are obtained by the project proponent with regards to activities in and around the Temescal Wash.

Noise: The project proponent shall be responsible for insuring that initial noise levels do not exceed the standards established in the Model Noise Ordinance or an equivalent standard established by the County of Riverside. If acoustical mitigation is required, it shall be the proponents responsibility to determine the methods of mitigation necessary and to insure that such methods result in the necessary mitigation. The proponent shall also monitor the initial blasting episodes to insure that actual vibration does not exceed the anticipated level. The on-site mine manager shall be responsible for monitoring weather conditions to verify that blasting does not occur during meteorological conditions, such as inversions, which could result in higher blast levels.

Air Quality: It is the responsibility of the South Coast Air Quality Management District to monitor the levels of air pollutants in the region of the project. The project proponent shall be responsible for obtaining all necessary permits to construct and operate required by the SCAQMD, and to provide that agency with the required records of operation.

The on-site mine manager shall be responsible for monitoring weather conditions to ensure that additional mitigation measures are taken during periods when daytime winds blow towards residential areas, including cessation of blasting and additional water spreading.

Vegetation and Wildlife: The project proponent shall monitor the condition of riparian environments to be preserved to guard against unfavorable impact by on-site activities and invasion by non-native plants such as giant reed and tamarisk. The on-site manager shall also monitor water levels in the pond, and provide an additional water source for wildlife if the pond should prove inadequate.

The County of Riverside is responsible for establishing a protection plan for the Stephens kangaroo rat, and enforcing compliance with these regulations.

Cultural, Historical and Prehistorical Resources: The on-site manager is responsible for remaining aware of the possibility of finding historical or prehistorical artifacts within any alluvium which is disturbed. If such a finding is made, it is his/her responsibility to notify the County immediately, and to insure that it is not disturbed in the interim.

Visual Aesthetics: During mining the project proponent shall monitor the vegetative screen along the western edge of the property to insure its health and usefulness. It is also his/her responsibility to monitor all night lighting to verify that no glare is being directed off-site. During reclamation the project proponent shall monitor the revegetation process to ensure its health and vigor.

Traffic: The Riverside County Road Department shall be responsible for monitoring the level-of-service on all County-maintained roads in the area of the project to insure adequacy.

Public Safety: Various local, state and federal agencies have a responsibility for monitoring the safety of operations on the Corona Quarry site. These include, but are not necessarily limited to:

- Federal Department of Transportation
- Bureau of Alcohol, Tobacco and Fire Arms
- Occupational Safety and Health Administration
- Mine Safety and Health Administration
- California Bureau of Mines
- Riverside County Department of Environmental Health

The project proponent is responsible for monitoring weather conditions to avoid blasting on days during inversions or adverse wind conditions. He/She is also responsible for seismically monitoring the initial blast sequences to insure that vibration and blast levels do not exceed those anticipated. He/She shall also monitor the condition of all fences and "No Trespassing" signs to insure their adequacy.

Fire Hazards: The Riverside County Fire Department is responsible for monitoring the site to insure that hazardous fire conditions are mitigated as much as possible.

5.0

APPENDICES

Appendix
5.1

Environmental Assessment Form
Notice Of Preparation
Responses

RIVERSIDE COUNTY PLANNING DEPARTMENT

Applicants Notice of Preparation
of
An Environmental Impact Report

DATE: August 9, 1988

PROJECT SPONSOR:

APPLICANT/OPERATOR:
Cal Mat Co.
3200 San Fernando Road
Los Angeles, CA 90065
Attn: G. Thomas Davis, Representative

PROJECT CASE NO./TITLE:

Surface Mining Permit No. 168

PROJECT LOCATION: East of Cajalco Street and south of Magnolia Avenue in the Corona area. Portions of Section 33, T3S, R6W and Section 4, T4S, R6W

PROJECT DESCRIPTION: Expansion of an existing 10 acre aggregate quarry and installation of crushing, screening and washing plant, concrete batch plant and asphalt plant on a 337 acre site. Site to be reclaimed upon completion of mining.

Pursuant to the Riverside County Rules to Implement the California Environmental Quality Act of 1970, it has been determined that the above referenced project may have a significant effect on the environment and an Environmental Impact Report (EIR) is required.

OPTION TO REVISE PROJECT:
Upon receipt of this notice, the project sponsor may revise the project to avoid or mitigate any adverse impact. If the potential adverse effects are substantially mitigated by the revised project, an EIR shall not be required and a Negative Declaration (statement of no significant effect) shall be prepared.

APPEAL:
The staff requirement to prepare an EIR may be appealed to the Planning Commission within ten (10) days of receipt of this notice. The appeal must be made in writing and contain brief discussion of how the project will avoid the environmental effects listed on the attachment. The appeal must be accompanied by: (1) adhesive labels containing the names and addresses of all property owners within 300 feet of the project boundaries; and (2) a filing fee of $80.00.

PREPARATION OF THE DRAFT EIR:
It has been determined that the project sponsor is responsible for the preparation of the Draft EIR, and should seek the services of an environmental consulting firm to prepare · draft document.

The Draft EIR must meet the form and content requirements of the Planning Department (see attached sheet for required topics). The sponsor should advise the consultant to meet with the staff on a regular basis to insure an adequate document is prepared in a timely fashion. A preliminary draft shall be submitted for review and if determined acceptable, the consultant will be notified of the appropriate number of final draft copies to be provided for distribution to state and local agencies, and interested parties.

The Draft EIR must be submitted within 120 days of this Notice unless an extension of not more than thirty (30) days is received and granted by the Department.

FEES:
A fee of $5,163.00 must be submitted to the Planning Department within thirty (30) days of this notice.

PROJECT PRESUMED ABANDONED:
Unless the fee and the Draft EIR are submitted within the time periods specified above, the project will be presumed abandoned, and the application will be immediately returned to the sponsor with no further action.

If you have any questions, please contact S. A. Kupferman at (714) 787-1377.

Very truly yours,

RIVERSIDE COUNTY PLANNING DEPARTMENT
Roger S. Streeter, Planning Director

Steven A. Kupferman - Engineering Geologist

PD 87-14
(Revised 7-87)

RIVERSIDE COUNTY PLANNING DEPARTMENT

Agency Notice of Preparation of An Environmental Impact Report

DATE: August 9, 1988

TO: See Attached Transmittal List (Attached)

PROJECT CASE NO./TITLE: Surface Mining Permit No. 16

PROJECT LOCATION: East of Cajalco Street and south of Magnolia Avenue in Corona area. Portions of Sec. 33, T3S, R6W and Sec. 4, T4S, R6W

PROJECT DESCRIPTION: Expansion of an existing 10 acre aggregate quarry and installation of crushing, screening and washing plant, concrete batch plant and asphalt plant on a 337 acre site. Site to be reclaimed after mining.

PROJECT SPONSOR: Cal Mat Co.
Attn: G. Thomas Davis
3200 San Fernando Road
Los Angeles, CA 90065

Pursuant to Riverside County Rules to Implement the California Environmental Quality Act notice is given to responsible and interested agencies, that the Riverside County Plannin Department plans to oversee the preparation on an Environmental Impact Report for the project The purpose of this notice is to solicit guidance from your agency as to the scope and conten of the environmental information to be included in the EIR. Information in that regard shoul be submitted to this office as soon as possible, but not later than forty-five (45) days afte receiving this notice.

Attached is a copy of the issues to be included in the draft EIR. If you have any questions please contact S. Kupferman at (714) 787- 1377.

Very truly yours,

RIVERSIDE COUNTY PLANNING DEPARTMENT
Roger S. Streeter, Planning Director

Steven A. Kupferman - Engineering Geologist

PD 85-15
Revised 10-85

4080 LEMON STREET, 9TH FLOOR
RIVERSIDE, CALIFORNIA 92501

46-209 OASIS STREET, ROOM 304
INDIO, CALIFORNIA 92201

Mail to: State Clearinghouse, 1400 Tenth Street, Room 121, Sacramento, CA 95814 — 916/445-0613

See NOTE below

SCH # ____

NOTICE OF COMPLETION AND ENVIRONMENTAL DOCUMENT TRANSMITTAL FORM

1. Project Title: Surface Mining Permit No. 168
2. Lead Agency: Riverside County Planning Dept. 3. Contact Person: S. Kupferman
3a. Street Address: 4080 Lemon St., 9th Floor 3b. City: Riverside
3c. County: Riverside 3d. Zip: 92501 3e. Phone: (714) 787-1377

PROJECT LOCATION 4. County: Riverside 4a. City/Community: Corona
4b. Assessor's Parcel No. 135-027-002 4c. Section 33, 4 Twp. T3S, T4S Range R6W
5a. Cross Streets: Magnolia Ave. & Cajalco St. 5b. For Rural, Nearest Community: Corona
6. Within 2 miles: a. State Hwy # I-15 b. Airports None c. Railways ATSF d. Waterways Temescal Wash

7. DOCUMENT TYPE

CEQA

01. X NOP
02. ___ Early Cons
03. ___ Neg Dec
04. ___ Draft EIR
05. ___ Supplement/Subsequent EIR (Prior SCH No.: ____)
06. ___ NOE
07. ___ NOC
08. ___ NOD

NEPA

09. ___ NOI
10. ___ FONSI
11. ___ Draft EIS
12. ___ EA

OTHER

13. ___ Joint Document
14. ___ Final Document
15. ___ Other ____

8. LOCAL ACTION TYPE

01. ___ General Plan Update
02. ___ New Element
03. ___ General Plan Amendment
04. ___ Master Plan
05. ___ Annexation
06. ___ Specific Plan
07. ___ Community Plan
08. ___ Redevelopment
09. ___ Rezone
10. ___ Land Division (Subdivision, Parcel Map, Tract Map, etc.)
11. ___ Use Permit
12. ___ Waste Mgmt Plan
13. ___ Cancel Ag Preserve
14. X Other Surface Mining Permit

9. DEVELOPMENT TYPE

01. ___ Residential: Units ____ Acres ____
02. ___ Office: Sq. Ft. ____ Acres ____ Employees ____
03. ___ Shopping/Commercial: Sq. Ft. ____ Acres ____ Employees ____
04. ___ Industrial: Sq. Ft. ____ Acres ____ Employees ____
05. ___ Water Facilities: MGD ____
06. ___ Transportation: Type ____
07. X Mining: Mineral Aggregate
08. ___ Power: Type ____ Watts ____
09. ___ Waste Treatment: Type ____
10. ___ OCS Related
11. ___ Other: ____

10. TOTAL ACRES: ____ 11. TOTAL JOBS CREATED: ____

12. PROJECT ISSUES DISCUSSED IN DOCUMENT

01. X Aesthetic/Visual
02. ___ Agricultural Land
03. X Air Quality
04. X Archaeological/Historical
05. ___ Coastal Zone
06. ___ Economic
07. X Fire Hazard
08. X Flooding/Drainage
09. ___ Geologic/Seismic
10. ___ Jobs/Housing Balance
11. ___ Minerals
12. X Noise
13. ___ Public Services
14. ___ Schools
15. ___ Septic Systems
16. ___ Sewer Capacity
17. ___ Social
18. X Soil Erosion
19. ___ Solid Waste
20. ___ Toxic/Hazardous
21. X Traffic/Circulation
22. X Vegetation
23. X Water Quality
24. ___ Water Supply
25. X Wetland/Riparian
26. X Wildlife
27. ___ Growth Inducing
28. ___ Incompatible Landuse
29. ___ Cumulative Effects
30. ___ Other ____

13. FUNDING (approx) Federal $ ____ State $ ____ Total $ ____

14. PRESENT LAND USE AND ZONING: Mineral Resource and Mountainous
Zoning - M-R-A (Mineral Resources)
A-2 (Heavy Agriculture)

15. PROJECT DESCRIPTION:

Expansion of an existing aggregate quarry and installation of crushing, screening and washing plant, concrete batch plant and asphalt plant on a 337 acre site. Site is to be reclaimed upon completion of mining.

8-8-88

REVIEWING AGENCIES

X Resources Agency	X Caltrans District 8
___ Boating/Waterways	___ Dept. of Transportation Planning
X Conservation	___ Aeronautics
X Fish and Game	___ California Highway Patrol
___ Forestry	___ Housing & Community Dev't.
___ Colorado River Board	___ Statewide Health Planning
X Dept. Water Resources	___ Health
___ Reclamation	___ Food & Agriculture
___ Parks and Recreation	___ Public Utilities Commission
___ Office of Historic Preservation	___ Public Works
___ Native American Heritage Commission	___ Corrections
___ S.F. Bay Cons. & Dev't. Commission	___ General Services
___ Coastal Commission	___ OLA
___ Energy Commission	___ Santa Monica Mountains
___ State Lands Commission	___ TRPA
X Air Resources Board	___ OPR - OLGA
___ Solid Waste Management Board	___ OPR - Coastal
___ SWRCB: Sacramento	___ Bureau of Land Management
X RWQCB: Region # 8	___ Forest Service
___ Water Rights	X Other: Mining and Geology
___ Water Quality	___ Other: ___

FOR SCH USE ONLY

Date Received at SCH ___	Catalog Number ___
Date Review Starts ___	Applicant ___
Date to Agencies ___	Consultant ___
Date to SCH ___	Contact ___ Phone ___
Clearance Date ___	Address ___

Notes: ___

RIVERSIDE COUNTY
PLANNING DEPARTMENT

Agency Notice of Preparation of An Environmental Impact Report

DATE: August 9, 1988

TO: See Attached Transmittal List (Attached)

PROJECT CASE NO./TITLE: Surface Mining Permit No. 168

PROJECT LOCATION: East of Cajalco Street and south of Magnolia Avenue in Corona area. Portions of Sec. 33, T3S, R6W and Sec. 4, T4S, R6W

PROJECT DESCRIPTION: Expansion of an existing 10 acre aggregate quarry and installation of crushing, screening and washing plant, concrete batch plant and asphalt plant on a 337 acre site. Site to be reclaimed after mining.

PROJECT SPONSOR: Cal Mat Co.
Attn: G. Thomas Davis
3200 San Fernando Road
Los Angeles, CA 90065

Pursuant to Riverside County Rules to Implement the California Environmental Quality Act notice is given to responsible and interested agencies, that the Riverside County Plannin Department plans to oversee the preparation on an Environmental Impact Report for the project. The purpose of this notice is to solicit guidance from your agency as to the scope and content of the environmental information to be included in the EIR. Information in that regard shoul be submitted to this office as soon as possible, but not later than forty-five (45) days afte receiving this notice.

Attached is a copy of the issues to be included in the draft EIR. If you have any questions please contact S. Kupferman at (714) 787- 1377.

Very truly yours,

RIVERSIDE COUNTY PLANNING DEPARTMENT
Roger S. Streeter, Planning Director

S. Kupferman

Steven A. Kupferman - Engineering Geologist

85-15
Revised 10-85

4080 LEMON STREET, 9TH FLOOR
RIVERSIDE, CALIFORNIA 92501
(714) 787-6181

46-209 OASIS STREET, ROOM 304
INDIO, CALIFORNIA 92201
(619) 342-8277

RIVERSIDE COUNTY PLANNING DEPARTMENT

ENVIRONMENTAL ASSESSMENT FORM: STANDARD EVALUATION

ENVIRONMENTAL ASSESSMENT (E.A.) NUMBER: 32943 MODULE NUMBER(s): 101

PROJECT CASE TYPE(s) AND NUMBERS(s): Surface Mining Permit No. 168

APPLICANT'S NAME: Cal Mat Co.

NAME OF PERSON(s) PREPARING E.A.: Steven Kupferman

I. PROJECT INFORMATION

A. DESCRIPTION (include proposed minimum lot size and uses as applicable): Expansion of an existing surface aggregate quarry, and installation, crushing and screening of rock materials, concrete batch plant and asphalt plant. Reclamation of site to occur after mining.

B. TOTAL PROJECT AREA: ACRES 337 ; or SQUARE FEET

C. ASSESSOR'S PARCEL NO.(s): 135-027-002, 003, 004, 005; 278-012-001; 278-013-001

D. EXISTING ZONING: M-R-A/A-2 IS THE PROPOSAL IN CONFORMANCE? Yes

E. PROPOSED ZONING: N/A IS THE PROPOSAL IN CONFORMANCE?

F. STREET REFERENCES: Southeast of Magnolia Avenue, east of Cajalco Street (private) and east of Highway 71

G. SECTION, TOWNSHIP, RANGE DESCRIPTION OR ATTACH A LEGAL DESCRIPTION: Section 33, T3S, R6W; Sec. 4, T4S, R6W

H. BRIEF DESCRIPTION OF THE EXISTING ENVIRONMENTAL SETTING OF THE PROJECT SITE AND ITS SURROUNDINGS: An existing rock quarry is located on the westerly portion of the site. The remainder is vacant, steep and rugged hillside terrain. The site is traversed by Temescal Wash at the west end of the property. Surrounding areas are vacant hillside to the north, east and south. Mining operations are located to the north and south; a salvage yard and abandoned landfill are located to the west.

II. COMPREHENSIVE GENERAL PLAN OPEN SPACE AND CONSERVATION DESIGNATION

Check the appropriate option(s) below and proceed accordingly.

☐ All or part of the project site is in "Adopted Specific Plans," "REMAP" or "Rancho Villages Community Policy Areas". Complete Sections III, IV (B and C only), V and VI.

☐ All or part of the project site is in "Areas Not Designated as Open Space". Complete Sections III, IV (A, B and D only), V and VI.

☒ All or part c' the project site has an Open Space and Conservation designation other than those mentioned

III. ENVIRONMENTAL HAZARDS AND RESOURCES ASSESSMENT

A. Indicate the nature of the proposed land use as determined from the descriptions as found in Comprehensive General Plan Figure VI.3 (Circle One). This information is necessary to determine the appropriate land use suitability ratings in Section III,B.

NA - Not Applicable   Critical   Essential   Normal-High Risk   Normal-Low Risk

B. Indicate with a yes (Y) or no (N) whether any environmental hazard and/or resource issues may significantly affect or be affected by the proposal. All referenced figures are contained in the Comprehensive General Plan. For any issue marked yes (Y) write additional data sources, agencies consulted, findings of fact and any mitigation measures under Section V. Also, where indicated, circle the appropriate land use suitability or noise acceptability rating(s). (See definitions at bottom of this page).

HAZARDS

1. N Alquist-Priolo Special Studies or County Fault Hazard Zones (Fig. VI.1)
   NA PS U R (Fig. VI.3)
2. N Liquefaction Potential Zone (Fig. VI.1)
   NA S PS U R (Fig. VI.4)
3. N Groundshaking Zone (Fig VI.1) II
   NA S PS U R (Fig. VI.5)
4. Y Slopes (Riv. Co. 800 Scale Slope Maps)
5. N Landslide Risk Zone (Riv. Co. 800 Scale Seismic Maps or On-site Inspection)
   NA S PS U R (Fig. VI.6)
6. Y Rockfall Hazard (On-site Inspection)
7. N Expansive Soils (U.S.D.A. Soil Conservation Service Soil Surveys)
8. Y Erosion (U.S.D.A. Soil Conservation Service Soil Surveys)
9. N Wind Ersosion & Blowsand (Fig. VI.1, Ord. 460, Sec. 14.2 & Ord. 484)
10. Y Dam Inundation Area (Fig. VI.7)
11. Y Floodplains (Fig. VI.7)
    NA U R (Fig. VI.8)
12. N Airport Noise (Fig. II.18.5, II.18.11 & VI.12 & 1984 AICUZ Report, M.A.F.B.)
    NA A B C D (Fig. VI.11)
13. N Railroad Noise (Fig. VI.13 - VI.16)
    NA A B C D (Fig. VI.11)
14. N Highway Noise (Fig. VI.17 - VI.29)
    NA A B C D (Fig. VI.11)
15. ___ Other Noise ______
    NA A B C D (Fig. VI.11)
16. Y Project Generated Noise Affecting Noise Sensitive Uses (Fig. VI.11)
17. N Noise Sensitive Project (Fig. VI.11)
18. Y Air Quality Impacts From Project
19. N Project Sensitive to Air Quality
20. Y Water Quality Impacts From Project
21. N Project Sensitive to Water Quality
22. N Hazardous Materials and Wastes
23. Y Hazardous Fire Area (Fig. VI.30 - VI.31)
24. ___ Other ______
25. ___ Other ______

RESOURCES

26. N Agriculture (Fig. VI.34 - VI.35)
27. N In or Near an Agricultural Preserve (Riv. Co. Agricultural Land Conversation Contract Maps)
28. Y Wildlife (Fig. VI.36 - VI.37)
29. Y Vegetation (Fig. VI.38 - VI.40)
30. Y Mineral Resources (Fig. VI.41 - VI.42)
31. N Energy Resources (Fig. VI.43 - VI.44)
32. Y Scenic Highways (Fig. VI.45)
33. N Historic Resources (Fig. VI.32 - VI.33)
34. ? Archaeological Resources (Fig. VI.32 - VI.33 & VI.46 - VI.48)
35. N Paleontological Resources (Paleontological Resources Map)
36. Y Other Visual Aesthetics
37. ___ Other ______

Definitions for Land Use Suitability and Noise Acceptability Ratings

NA - Not Applicable	S - Generally Suitable	PS - Provisionally Suitable
U - Generally Unsuitable	R - Restricted	A - Generally Acceptable
B - Conditionally Acceptable	C - Generally Unacceptable	D - Land Use Discouraged

IV. LAND USE DETERMINATION

A. Complete this part unless the project is located in "Adopted Specific Plans", "REMAP" or "Rancho Villages Community Policy Areas."

1. OPEN SPACE AND CONSERVATION MAP DESIGNATION(s): Mineral Resources and Mountainous
2. LAND USE PLANNING AREA: Riverside/Corona/Norco
3. SUBAREA, IF ANY: N/A
4. COMMUNITY POLICY AREA, IF ANY: None
5. COMMUNITY PLAN, IF ANY: None
6. COMMUNITY PLAN DESIGNATION(s), IF ANY: N/A
7. SUMMARY OF POLICIES AFFECTING PROPOSAL: Mining land uses will be encouraged in portions of Temescal Valley, according to L.U.P.A.

B. For all projects, inidcate with a yes (Y) or no (N) whether any public facilities and/or services issues may significantly affect or be affected by the proposal. All referenced figures are contained in the Comprehensive General Plan. For any issue marked yes (Y), write data sources, agencies consulted, findings of fact, and mitigation measures under Section V.

PUBLIC FACILITIES AND SERVICES

1. Y Circulation (Fig. IV.1-IV.11. Discuss in Sec. V Existing, Planned & Required Roads)
2. N Bike Trails (Fig. IV.12 - IV.13)
3. Y Water (Agency Letters)
4. Y Sewer (Agency Letters)
5. N Fire Services (Fig. IV.16 - IV.18)
6. N Sheriff Services (Fig IV.17 - IV.18)
7. N Schools (Fig. IV.17 - IV.18)
8. N Solid Waste (Fig. IV.17 - IV.18)
9. N Parks and Recreation (Fig. IV.19 - IV.20)
10. N Equestrian Trails (Fig. IV.19 - IV.24/ Riv. Co. 800 Scale Equestrian Trail Maps)
11. N Utilities (Fig. IV.25 - IV.26)
12. N Libraries (Fig. IV.17 - IV.18)
13. N Health Services (Fig. IV.17 - IV.18)
14. N Airports (Fig. II.18.2 - II.18.4, II.18.8 - II.18.10 & IV.27 - IV.36)
15. N Disaster Preparedness
16. Y City Sphere of Influence
17. ___ Other ___

C. If all or part of the project is located in "Adopted Specific Plans", "REMAP" or "Rancho Villages Community Policy Areas", review in detail the specific policies applying to the proposal, and complete the following:

1. State the relevant land use designation(s): ___
2. Based on this initial study, is the proposal consistent with the policies and designations of the appropriate document, and therefore consistent with the Comprehensive General Plan? If not, explain: ___

IV. LAND USE DETERMINATION (continued)

D. If all or part of the project site is in "Areas not Designated as Open Space", and is not in a Community Plan, complete questions 1, 2, 3, 6 and 7. Complete questions 4, 5, 6 and 7 if it is in a Community Plan.

1. Land use category(ies) necessary to support the proposed project. Also indicate land use type (i.e. residential, commercial, etc.) ________________

2. Current land use category(ies) for the site based on existing conditions. Also indicate land use type (i.e. residential, commercial, etc.) ________________

3. If D.1 differs from D.2, will the difference be resolved at the development stage? Explain:

4. Community Plan designation(s): ________________

5. Is the proposed project consistent with the policies and designations of the Community Plan? If not, explain: ________________

6. Is the proposal compatible with existing and proposed surrounding land uses? If not, explain: ________________

7. Based on this initial study, is the proposal consistent with the Comprehensive General Plan? If not, reference by Section and Issue Number those issues identifying inconsistencies: ________________

E. If all or part of the project site is in an Open Space and Conservation designation, complete the following:

1. State the designation(s): Mineral Resources on the westerly 2/3 and Mountainous on the easterly 1/3.

2. Is the proposal consistent with the designation(s)? If not, explain: N/A

3. Based on this initial study, is the proposal consisent with the Comprehensive General Plan? If not, reference by Section and Issue Number those issues identifying inconsistencies: N/A

V. INFORMATION SOURCES, FINDINGS OF FACT AND MITIGATION MEASURES

A. ADDITIONAL INFORMATION REQUIRED BEFORE ENVIRONMENTAL ASSESSMENT CAN BE COMPLETED:

SECTION/ ISSUE NO.	INFORMATION REQUIRED	DATE INFORMATION REQUESTED	DATE INFORMATION RECEIVED	ADEQUACY DETERMINATION (YES/NO,DATE)

B. For each issue marked yes (Y) under Sections III.B and IV.B, identify the Section and issue number and do the following, in the format as shown below:

1. List all additional relevant data sources, including agencies consulted.
2. State all findings of fact regarding environmental concerns.
3. State specific mitigation measures, if identifiable without requiring an environmental impact report (E.I.R.)
4. If additional information is required before the environmental assessment can be completed, refer to Subsection A.
5. If additional sheets are needed to complete this section, check the box at the end of the section and attach the necessary sheets.

SECTION/ ISSUE NO.	SOURCES, AGENCIES CONSULTED, FINDINGS OF FACT, MITIGATION MEASURES:
IIIB,4&6	Riv. Co. 800 Scale Map #28 - A_2 designation - low slope instability. Rock types are hard, dense igneous and metamorphic rocks which limited slope instability problem. Mining on benches will mitigate potential slope impacts and engineering geologic evaluation for this project indicates some wedge failure potential, but will not affect overall gross stability.
IIIb,8	Erosion for the soils on this site is considered high on slopes 15-50% according to Western Riverside County Soil Survey. Mining will disturb large areas of the site, thus increasing the potential for this hazard.
IIIB,10,11	The westerly portion of the site, along Temescal Creek is in a 100 yr. floodplain and dam inundation area (Lake Mathews). Proposed processing facilities will be sited in these areas. General Plan, Fig. VI.8 indicates that heavy industry is generally unsuitable in floodplains unless a site investigation indicates that hazards can be mitigated.
IIIB,16	Noise and vibrations from the planned mining and processing, and truck traffic may impact adjacent neighborhoods in Home Gardens and El Cerrito. Mining and blasting will occur at the upper elevations of the site. Operating hours restrictions to daytime hours, similar to adjacent mining properties may mitigate impacts.

V. INFORMATION SOURCES, FINDINGS OF FACT AND MITIGATION MEASURES (continued)

SECTION/ ISSUE NO.	SOURCES, AGENCIES CONSULTED, FINDINGS OF FACT, MITIGATION MEASURES:
IIIB,18	Air quality impacts will result from mining, blasting, processing (crushing, screening, concrete, and asphalt) plants, and truck traffic. Dust, plant and vehicle exhaust will add to degraded air quality in this area. These impacts should be established so that appropriate mitigation measures such as dust control by use of water or chemical can be used.
IIIB,20	Impacts to surface water quality in Temescal Creek and groundwater quality may result from this project. Wash water ponds will be used for the screening and washing plant.
IIIB,23	Project is in a fire hazard area (Fig. VI.30). Fire hazards will be mitigated by clearance from Fire Dept. and conditions of approval, such as a requirement of spark arrestors on mining equipment.
IIIB,28	Portions of the east end of the site are within the Stephens' Kangaroo Rat range and/or habitat. Sensitive species may exist in the portion of the site traversed by Temescal Wash; however, this area has been disturbed by mining in the past. A complete biological assessment of the site should be made. Habitats will be eliminated by quarrying.
IIIB,29	Most of the site supports a White Sage Plant Community with a small portion as Riparian Woodland along Temescal Wash. Mining will eliminate a majority of these plant communities. Reclamation will replace vegetation in flat-lying area, upon completion of mining.

☒ See attached pages.

VI. ENVIRONMENTAL IMPACT DETERMINATION:

☐ The project will not have a significant effect on the environment and a Negative Declaration may be prepared.

(or)

☐ The project could have a significant effect on the environment; however, there will not be a significant effect in this case because the mitigation measures described in Section V have been applied to the project and a Negative Declaration may be prepared.

(or)

☒ The project may have a significant effect on the environment and an Environmental Impact Report is required.

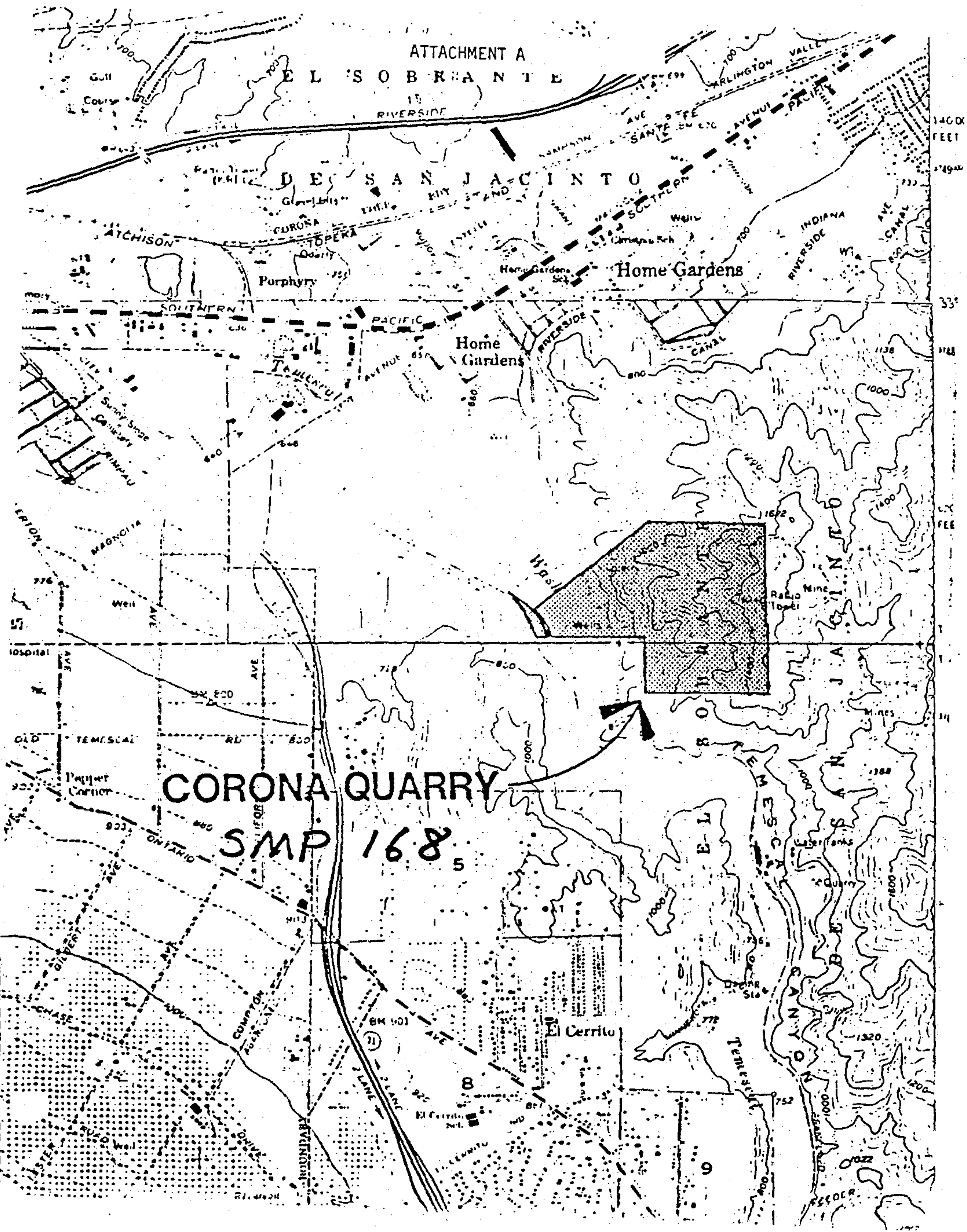
Name: [signature] Date: 8-8-88

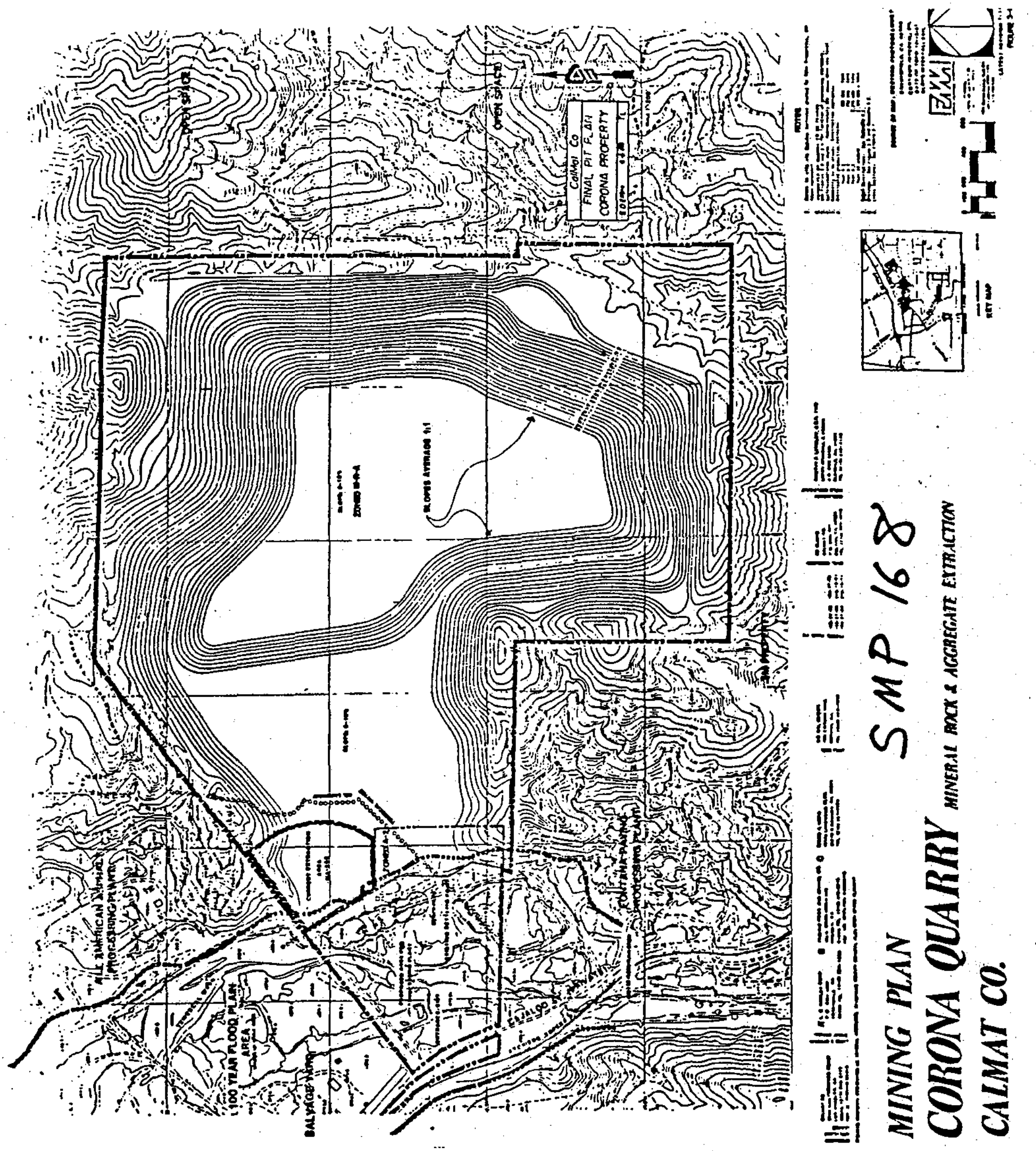
Prepared by

V. INFORMATION SOURCES, FINDINGS OF FACT AND MITIGATION MEASURES (continued)

SECTION/ ISSUE NO.	SOURCES, AGENCIES CONSULTED, FINDINGS OF FACT, MITIGATION MEASURES:
IIIB,30	The site has been classified by the State as an MRZ-2 (mineral resource) and is zoned M-R-A by the County. Aggregate from this source will supply the increasing demand in the region.
IIIB,32	The project is within one mile, and within view of I-15, an Eligible Stage Scenic Hwy. Many mining and industrial uses are already impacting the highway in this area of Corona.
IIIB,34	A cultural resources study should be made of the site to evaluate archaeological resources. Impacts are unknown.
IIIB,36	Visual and aesthetic resources will be impacted since the mining operation proposes to make significant landform and topographic changes to this 300± acre site. Quarry depths up to 1,100 feet are proposed and portions of the quarry will be visible from much of the surrounding area.
IVB1	Circulation impacts will be to Cajalco Street and Magnolia Ave. Within 10 years the project proposed to produce up to 5 million tons of aggregate. It is expected that significant truck traffic will haul rock, concrete and asphalt off this site.
IVB3	A water pipe line crosses the project. The water line will be relocated prior to expanding the mining operation.
IVB4	Letter from Environmental Health, dated 8-2-88
IVB,16	City of Corona

ATTACHMENT A





ATTACHMENT B

ATTACHMENT C
AGENCY TRANSMITTAL LIST

Agencies to Receive NOP

State Clearinghouse
Building and Safety Department
Surveyor
Road Department
Health Department-Environmental Health Division
Fire Department
Flood Control District
Local Agency Formation Commission (LAFCO)
Assessor's Office

California Air Resources Board
Division of Mines and Geology
Department of Water Resources
Department of Fish and Game
California Resources Agency

Department of Transportation: District 8
South Coast Air Quality Management District
Water Quality Control Board #8, Santa Ana Region
Riverside County Parks and Recreation Department
Western Municipal Water District
Corona City Water Company
Southern California Edison Company
Southern California Gas Company
Atchison, Topeka & Santa Fe Railroad
Pacific Bell Company
City of Corona
Greater Lake Mathews Area Association
California Native Plant Society
Sierra Club
Audubon Society
Bel Air Homeowners Association

Persons to Receive NOP

Supervisor Walt Abraham
Commissioner Jack Bresson

Attachment D

The Draft Environmental Impact Report shall address all topics required by Sections 15140 through 15145 of the State EIR Guidelines (copy attached); however, the following concerns shall be emphasized in the report:

1. Hydrology impacts from mining
   a. drainage
   b. erosion
   c. flooding
   d. groundwater
   e. surface and subsurface water quality

2. Project Generated Noise and Vibrations

3. Air Quality and Cumulative Impacts
   a. dust from mining and processing areas
   b. vehicle emissions
   c. asphalt plant emissions

4. Biological resources in riparian habitat, White Sage plant community, and Stephens' Kangaroo Rat.

5. Archaeological Resources

6. Visual and Aesthetic Impacts
   a. mining areas
   b. processing plants

7. Circulation Impacts

8. Public Safety
   a. site access
   b. blasting

9. Fire Hazard

ACKNOWLEDGEMENT

State of California
Project Notification and Review System
Office of the Governor
(916) 445-0613

SURFACE MINING PERMIT # 168
State Clearinghouse Number: 88081517
State Review Period: 08/18/88 to 09/16/88
Contact: JOHN KEENE
Phone: 916-445-0613 Fax: 916-323-3749
(Review Starts On Next Working Day When Document Is Received After 10:00 am)

Please use the State Clearinghouse Number on future correspondence with this office and with agencies approving or reviewing your project.

This card does not verify compliance with environmental review requirements. A letter containing the State's comments or a letter confirming no State comments will be forwarded to you after the review is complete.

Rev. 8/82

OFFICE OF: Planning Department

(714) 736-2269

815 WEST SIXTH STREET (P.O. BOX 940), CORONA, CALIFORNIA 91718-0090

September 28, 1988

Mr. Steve Kupferman
Riverside County Planning Department
4080 Lemon Street, 9th Floor
Riverside, Ca. 92501

RE: NOP FOR AN EIR FOR SURFACE MINING PERMIT NO. 168

Dear Mr. Kupferman,

Thank you for the opportunity to review the issues to be included in the EIR for Surface Mining Permit No. 168.

Please refer to the attached letter of August 9, 1988 which discusses items of concern to the City of Corona. These concerns should be discussed in the EIR. Of particular concern is the heavy truck traffic, created by the project, which will use Magnolia Avenue within the City of Corona.

We would appreciate the opportunity to review the draft EIR for the proposed quarry when its available.

Sincerely,

WILLIAM KETTEMAN
Planning Director

By Belle Newman
Belle Newman
Associate Planner

BN/ms

OFFICE OF: Planning Department

(714) 736-2449

815 WEST SIXTH STREET (P.O. BOX 940), CORONA, CALIFORNIA 91718-0090

August 9, 1988

Mr. Steve Kupferman
Riverside County Planning Department
4080 Lemon Street, 9th Floor
Riverside, Ca. 92501

RE: SURFACE MINING PERMIT APPLICATION FOR CORONA QUARRY

Dear Mr. Kupferman,

Thank you for the opportunity to comment on the Surface Mining Permit application for Corona Quarry.

A review of the Permit Application revealed several items of concern to the City of Corona. Of particular concern is the heavy truck traffic (266 to 666 trips per day in 10 years) that will use Magnolia Avenue within Corona in order to access the I-15 Freeway. Potential impacts include traffic control, increased costs of maintaining Magnolia Avenue, noise from the accelerating trucks and safety considerations.

Other concerns include potential effects the proposed mining operation and reclamation plan will have on the following:

1. Existing drainage pattern at the site and within the 100 year floodplain.
2. Ground water quality.
3. Noise levels in the vicinity especially during blasting.
4. Dust levels.
5. Habitats of the Least Bell's Vireo and the Stephens Kangaroo Rat, and proposed habitat reclamation plans for these animals.

Also of concern is the loss of vegetation and the large bowl like excavation resulting from the mining operation. The proposed reclamation plan fails to adequately address how the site will be suitably reclaimed for subsequent uses or what alternative uses would be appropriate for the site. There is no discussion on how the resulting topography would lend itself to alternative uses or how the reclaimed land could be adapted for alternative uses.

The plan does not describe preparation of the site, fill material, top soil replacement and plant species which would be appropriate for the revegetation of the land, not only on the slopes but on the entire site.

A maintenance program should ensure revegetation and monitor water quality. The plan should also specify the assurance mechanism which will guarantee the reclamation of the site.

The City of Corona requests that the above concerns be addressed in an EIR or focused EIR. We would appreciate the opportunity to review a draft EIR for the proposed quarry when its available.

If you should have any questions, please contact Belle Newman at (714) 736-2449.

Sincerely,

WILLIAM KETTEMAN
Planning Director

By Belle Newman
BELLE NEWMAN
Associate Planner

BN/ms
QUARRY

RIVERSIDE COUNTY
FIRE DEPARTMENT

IN COOPERATION WITH THE
CALIFORNIA DEPARTMENT OF FORESTRY
AND FIRE PROTECTION

RAY HEBRARD
FIRE CHIEF

Planning & Engineering Office
46-209 Oasis Street, Suite 405
Indio, CA 92201
(619) 342-8886

Planning & Engineering Office
4080 Lemon Street, Suite 11L
Riverside, CA 92501
(714) 787-6606

August 30, 1988

RECEIVED
AUG 31 1988
RIVERSIDE COUNTY
PLANNING DEPARTMENT

TO: PLANNING DEPARTMENT

ATTN: STEVE KUPFERMAN

RE: NOTICE OF PREPARATION E.I.R.
SURFACE MINING PERMIT 168

The expansion of an existing aggregate quarry in the Home Gardens area will have minimal impact on Fire Department operations.

All questions regarding the meaning of conditions shall be referred to the Fire Department Planning and Engineering staff.

RAYMOND H. REGIS
Chief Fire Department Planner

By Michael E. Gray

Michael E. Gray,
Deputy Fire Department Planner

ama

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF CONSERVATION
DIVISION OF MINES AND GEOLOGY
SACRAMENTO OFFICE
'0 BERCUT DRIVE
.CRAMENTO, CA 95814-0131
(Phone 916-323-8567)

1988

RECEIVED
SEP 6 1988
CALMAT PROPERTIES

August 26, 1988

Mr. Steven Kupferman
Engineering Geologist
Riverside County Planning Department
4080 Lemon Street, 9th Floor
Riverside, California 92501

Dear Mr. Kupferman:

Notice of Preparation of an EIR for Expansion of Corona Quarry Surface Mining Permit No. 168

The Mine Reclamation Program staff of the Department of Conservation's Division of Mines and Geology has reviewed the documents submitted for the Expansion of Corona Quarry. Mine Reclamation Program files were also reviewed. The following comments, prepared by James Pompy and Gail Newton of the Mine Reclamation Program staff, are offered to assist in your review of this project.

The Surface Mining and Reclamation Act of 1975 (SMARA) and the State Mining and Geology Board regulations for surface mining and reclamation practice (California Administrative Code (CAC) Title 14, Chapter 8, Article 1, Section 3500 et seq.) (copies enclosed) require that a reclamation plan be submitted to and approved by the lead agency prior to the commencement of any new mining operations.

Included in the reclamation plan should be the proposed end use and a description of how the land will be reclaimed for the proposed end use. Specific issues that are required to be addressed are listed in SMARA Section 2772 and CAC Sections 3502 and 3503. A signed statement that the person submitting the plan accepts responsibility for reclaiming the mined lands in accordance with the reclamation plan should also be included.

The proposed biological assessment of the site should provide information not only on the unique resources of the site (i.e. riparian habitat and Stephens' kangaroo rat), but also information on how the reclamation plan can be designed to

Mr. Steven Kupferman
Page 2

allow for the continued survival or replacement of these resources. The assessment should include a complete list of plant species currently found on the site, and it should identify those species which are good candidates for inclusion in the revegetation plan.

The Mine Reclamation Program staff will, if requested, provide technical assistance to the County of Riverside in the review of the reclamation plan.

Please send a copy of the approved reclamation plan and permit issued by you as lead agency under SMARA. The approved documents will be placed in Mine Reclamation Program files pursuant to the Surface Mining and Reclamation Act.

If you have any questions on these comments or require any assistance with other mine reclamation issues, please contact me at (916) 323-8565.

Sincerely,

James Pompy

James S. Pompy
Mine Reclamation Program Manager

Enclosures

OFFICE OF THE ROAD COMMISSIONER AND COUNTY SURVEYOR
COUNTY OF RIVERSIDE

LeRoy D. Smoot
Road Commissioner and
County Surveyor

County Administrative Center
Mailing Address: P.O. Box 1090
Riverside, Ca 92502
Telephone - (714) 787-6554

August 22, 1988

Roger Streeter, Planning Director
Riverside County Planning Department
4080 Lemon Street
Riverside, CA 92501

ATTN: Steve A. Kupferman, Engineering Geologist

RE: Notice of Preparation of an Environmental Impact Report for SMP 168

Dear Mr. Kupferman:

The Riverside County Road Department has reviewed the project referenced above and has the following comments.

The Road Department requests a traffic impact analysis in accordance with the County Standards. The analysis should include Intersection Capacity Utilization (ICU) of the freeway ramps and Cajalco Road and Magnolia Avenue. The analysis should also include trip generation, average daily trip ends, and peak day trip ends.

The Road Department requests the following operational information:

1. Size of trucks.
2. Laden Weight.
3. Proposed truck routes within a one mile radius.
4. Load type (dry material, wet material, etc.)
5. Hours of operation.

If you desire additional information, contact me at (714) 787-1445.

Sincerely,

John Johnson
Associate Planner

JJ:AE:lg

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF FISH AND GAME
330 Golden Shore, Suite 50
Long Beach, CA 90802
(213) 590-5113

RECEIVED
AUG 2 1988
PLANNING DEPARTMENT

August 22, 1988

Steven A. Kupferman
Riverside County Planning Department
4080 Lemon Street, 9th Floor
Riverside, CA 92501

Dear Mr. Kupferman:

We have reviewed the Notice of Preparation of a Draft EIR for Surface Mining Permit No. 168. To enable our staff to adequately review and comment on this project, we recommend the following information be included in the Draft EIR:

1) A complete assessment of flora and fauna within the project area. Particular emphasis should be placed upon identifying endangered, threatened, and locally unique species; 2) documentation of direct, indirect, and cumulative impacts expected to adversely affect biological resources within and adjacent to the project site; 3) mitigation measures proposed to offset such impacts; and 4) assessment of growth-inducement factors potentially affecting natural open space and biological resources. Set aside natural open space in sufficient acreage to provide habitat for native wildlife and include landscape programs, with native trees and shrubs, to provide habitat for wildlife.

Diversion or obstruction or changes in the bed, channel, or bank of any river, stream, or lake will require notification to the Department of Fish and Game as called for in the Fish and Game Code. This notification (with fee) and the subsequent agreement must be completed prior to initiating any such changes. Notification should be made after the project is approved by the lead agency.

Thank you for the opportunity to review and comment on this Notice of Preparation. If you have any questions, please contact Jack L. Spruill of our Environmental Services staff at (213) 590-5137.

Sincerely,

Fred Worthley

Fred Worthley
Regional Manager
Region 5

cc: Office of Planning & Research

Southern California Edison Company

P O BOX 788

RIALTO, CALIFORNIA 92376

2885 FOOTHILL BOULEVARD

SAN BERNARDINO, CALIFORNIA 92402

JOHN D. WYATT
REGIONAL AFFAIRS MANAGER
EASTERN DIVISION

TELEPHONE
(714) 820 5238

August 23, 1988

RECEIVED
AUG 26 1988
RIVERSIDE COUNTY
PLANNING DEPARTMENT

Mr. Roger S. Streeter, Planning Director
Riverside County Planning Department
4080 Lemon Street, 9th Floor
Riverside, CA 92501

Attention: Steven A. Kupferman
Engineering Geologist

Dear Roger:

Subject: Surface Mining Permit No. 168
Environmental Impact Report

This is to advise that the subject property is located within the service territory of the Southern California Edison Company and that the electric loads of the project are within the parameters of the overall projected load growth which we are planning to meet in this area.

Unless the demand for electrical generating capacity exceeds our estimates, and provided that there are no unexpected outages to major sources of electrical supply, we expect to meet our electrical requirements for the next several years.

Edison has developed several programs which may prove extremely helpful to customers in increasing the efficiency of their operations and holding down energy costs. Included among these are the new construction program and off-peak cooling. For more information, call the local Energy Services Department at 714-820-5212.

Very truly yours,

John D. Wyatt

JDW:aw

RIVERSIDE COUNTY PLANNING DEPARTMENT

SEP 09 1988
RIVERSIDE COUNTY PLANNING DEPARTMENT

Agency Notice of Preparation of An Environmental Impact Report

RECEIVED
AUG 15 1988
City of Corona
Utility Services

RECEIVED
SEP 16 1988

DATE: August 9, 1988

TO: See Attached Transmittal List (Attached)

See if this area is within our existing water service NO area, the future annexation south of Magnolia YES and the City's sphere YES. If in either of the last two get with planning at first looks & see if they also want to comment
Don

P.W. : NONE

WKG: SEE ATTACHED

PROJECT CASE NO./TITLE: Surface Mining Permit No. 168

PROJECT LOCATION: East of Cajalco Street and south of Magnolia Avenue in Corona area. Portions of Sec. 33, T3S, R6W and Sec. 4, T4S, R6W

PROJECT DESCRIPTION: Expansion of an existing 10 acre aggregate quarry and installation of crushing, screening and washing plant, concrete batch plant and asphalt plant on a 337 acre site. Site to be reclaimed after mining.

PROJECT SPONSOR: Cal Mat Co.
Attn: G. Thomas Davis
3200 San Fernando Road
Los Angeles, CA 90065

Pursuant to Riverside County Rules to Implement the California Environmental Quality Act, notice is given to responsible and interested agencies, that the Riverside County Planning Department plans to oversee the preparation on an Environmental Impact Report for the project. The purpose of this notice is to solicit guidance from your agency as to the scope and content of the environmental information to be included in the EIR. Information in that regard should be submitted to this office as soon as possible, but not later than forty-five (45) days after receiving this notice.

Attached is a copy of the issues to be included in the draft EIR. If you have any questions, please contact S. Kupferman at (714) 787- 1377.

Sept 30

Very truly yours,

RIVERSIDE COUNTY PLANNING DEPARTMENT
Roger S. Streeter, Planning Director

UTILITY SERVICES:

NO COMMENTS.

J. Simoni
9-7-88

S. Kupferman

Steven A. Kupferman - Engineering Geologist

PD -15
RE SED 10-85

Appendix 5.2

Organizations and Persons Consulted

5.2 ORGANIZATIONS AND PERSONS CONSULTED

BelAir Homeowners Association

City of Corona
Planning Department
William Ketteman, Planning Director
Belle Newman, Associate Planner
815 West Sixth Street
Corona, California 91718

County of Riverside
Fire Department
Raymond H. Regis, Chief Fire Department Planner
Michael E. Gray, Deputy Fire Department Planner
Planning and Engineering Office
4080 Lemon Street, Suite 11L
Riverside, California 92501

County of Riverside
Flood Control and Water Conservation District
1995 Market Street
Riverside, California 92502

County of Riverside
Planning Department
Steven A. Kupferman, Engineering Geologist
Richard Fairhurst, Planner
4080 Lemon Street, 9th Floor
Riverside, California 92501

El Cerrito Homeowners Association

State of California
Department of Conservation
Divisions of Mines and Geology
James S. Pompy, Mine Reclamation Program Manager
David J. Beeby, Senior Geologist, Program Manager

State of California
Department of Fish and Game
Fred Worthley, Regional Manager, Region 5
330 Golden Shore, Suite 50
Long Beach, California 90802

State of California
State Clearinghouse
John Keene
1400 Tenth Street, Room 121
Sacramento, California 95814

U.S. Army Corps of Engineers
P.O. Box 2711
Los Angeles, California 90053-2325

Appendix
5.3

References

5.3 REFERENCES

Atwood, J.L., "The United States Distribution of the California Black-tailed Gnatcatcher," in *Western Birds,* Vol. 11, No. 2.

Bolton, Herbert E., *Anza California Expeditions,* Vol. 3, University of California Press, 1930.

California Department of Conservation, Division of Mines and Geology, Special Report 143, Part 7, *Mineral Land Classification of Greater Los Angeles,* 1983.

California Department of Conservation, Mining and Geology Board, SMARA EIR No. 3 (SCH#82042314), *Designation of Regionally Significant Construction Aggregate Resource Areas in the Orange County-Temescal Valley and San Gabriel Valley Production-Consumption Regions,* December 1982.

California Department of Fish and Game, *Areas of Special Biological Importance,* 1979.

County of Riverside, *Comprehensive General Plan,* Second Edition, December 1986.

Drummy-Chapel, Vada, *Historical Assessment of the Temescal Valley Project, County of Riverside, California,* June 1982.

Friesen, Richard Dean, *Stephens Kangaroo Rat Study, Temescal Valley Properties, Riverside County, California,* March 1984.

Goldman, H.B., "Aggregates from Fossils," in *Rock Products,* Vol. 65, No. 11, 1962.

Patterson, T., *A Colony for California,* 1971.

South Coast Air Quality Management District, *Summary of Air Quality in California's South Coast Air Basin, Air Quality Data 1987 Update,* 1988.

Southern California Rock Products and Ready-Mixed Concrete Associations, *Building Cities .... Producing Jobs: The Gravel Lands - A Natural Resource,* undated brochure.

Appendix
5.4

List of EIR Preparers

5.4 LIST OF EIR PREPARERS

The Focused Environmental Impact Report on the Corona Quarry project has been prepared for the County of Riverside (lead agency) with environmental data collected, analyzed, compiled by FMA (Florian Martinez Associates). Major contributions were made toward the preparation of the Focused EIR by the following:

FMA (Florian Martinez Associates)

Donna McCormick	Principal Author, Planning Analyst
Richard K. Goacher	Project Director

Robert H. Born Consulting Engineers, Inc.

Robert H. Born, P.E.	Hydrology

Huitt-Zollars, Inc., Consulting Engineers

J. Anthony Sosebee, P.E.	Hydrology

Mestre Greve Associates

Paul H. Dunholter, P.E.	Air Quality, Noise, Vibration
William Bloomer	Air Quality, Noise, Vibration

Tierra Madre Consultants

Stephen J. Myers	Biology
Lawrence F. LaPre, PhD	Biology

Scientific Resource Surveys, Inc.

Roderic McLean	Archaeology, History

David Trueblood

David Trueblood	Artist Renditions

Kunzman Associates

Lee Royalty, P.E.	Traffic

Don Harris and Associates

Donald G. Harris	Blasting, Vibration and Public Safety

Appendix
5.5

Hydrology Report

HYDROLOGIC IMPACTS FROM MINING

Drainage and Flooding

Existing Conditions - The Corona Quarry site is situated along the eastern side of the Temescal Wash, a small ephemeral stream which serves as the principal drainage channel for most of the surrounding area. This channel begins at Lake Elsinore southeast of the site, and extends northerly to the its confluence with the Santa Ana River near Prado Dam. There have been only minor flood control improvements made to the channel, primarily streambed realignments and channelization, but not within this site. The ongoing mining operations along the wash have modified the original stream profile.

Although a portion of the subject property is located within the wash itself, no significant alteration of streamflow patterns has occurred. Approximately 30% of the alluvial deposit along Temescal Wash within the property is located within the 100-year floodplain. Historically, sand and gravel mining operators along Temescal Wash have attempted to bypass a portion of the flow of Temescal Wash around their deep, closed excavations, in order to permit dry mining above groundwater levels. The wash and all associated culverts and roads, including an upstream railroad bridge are totally inundated during the 100-year flood event.

The 100-year floodplain boundary, based upon a 100-year discharge estimated at 24,000 CFS, is shown on the Reclamation Plan drawings. Note that the depicted 100-year floodplain boundary does not agree with the 100-year floodplain boundaries appearing on the latest published Flood Insurance Rate Map (FIRM). Boundaries appearing on the referenced drawing reflect the results of a detailed study using HEC-2 methodology as prescribed by Federal Emergency Management Agency and the U.S. Army Corp of Engineers using current topography. The existing FIRM is based on an approximate analysis using topography which is at substantial variance with existing landforms.

An existing low flow culvert crosses the Temescal wash near the northern property boundary. This culvert is expected to be damaged or destroyed by floods of 20-year magnitude or greater.

The remainder of the site is fairly steep and generally slopes in a westerly direction towards Temescal Wash. Runoff is directed into one of two arroyos which carry flow to the wash. These water courses are located parallel to and near the northern and southern property lines.

Potential Impacts - It is anticipated during proposed quarry operations, that no improvements will be made within the floodway and floodplain of Temescal Wash, except by rebuilding the existing access road. No adverse impacts are anticipated on drainage patterns as a result of the proposed quarry operations.

Culverts will be installed within the plant site and on access roads for local drainage control. Bedrock materials within the rock quarry area are stable and will not require erosion control treatment.

Stockpiles will be located outside of the floodplain and will not impact flows during rainfall events. Reference is directed to the Processing Plant Plans for proposed Phase I and Phase II operations.

To direct runoff from the two arroyos into the Temescal Wash, channelization is likely in the area around the proposed processing plants. To assist with reducing sediment transported into the wash, sediment traps are proposed on either side of the processing plant before the arroyo discharges into Temescal Wash.

Mitigation of Impacts - The only improvement planned within the Temescal Wash is rebuilding the access road to the processing plant. When this access road is improved, appropriate analysis and design will be prepared to properly address hydraulic issues, maintain existing channel characteristics, and provide for an all-weather access to the processing plant.

<u>Erosion</u>

Existing Conditions - Local topography on the Corona Quarry site has slopes which range from practically flat to up to 50%. Erosion is considered high on slopes that are from 15 to 50% steep. However, the natural materials occuring on site are not characteristically easily eroded, except in the steepest portions of the site. Natural materials are currently located on the surface, but may not remain after a mined condition.

Potential Impacts - Since natural drainage patterns typically flow towards the west and into the Temescal Wash, it is anticipated that some erosion will occur which could enter into Temescal wash. As mining continues, this erosion potential will be lessened as silts and sediments will be captured within the open pit excavation. Also, the processing plants will tend to act as a buffer in capturing sediments from unmined portions of the site.

Mitigation of Impacts - To reduce the erosion potential from the site into Temescal Wash, it is anticipated that one or two sediment traps will be located in the flatter areas outside the floodplain of Temescal Wash to capture sediments and silts which may be displaced. These sediment traps could be located to capture silts or fines from the processing plant areas as well. Thus, it would not be unreasonable to expect run-off from the site into the Temescal Wash to have a lower quantity of sediments and silts than would naturally occur.

<u>Groundwater</u>

Existing Conditions - Groundwater levels in the vicinity of the subject property are currently most easily observed by the fluctuations in the surface level of water within the excavation at the southerly property boundary. Groundwater levels vary from season to season and from month to month, and are mostly a function of recharge from runoff along the Temescal Wash. Groundwater levels are expected to vary from 10 feet to approximately 30 feet below the adjacent ground surface. These levels would be a function of dry year to wet year conditions.

Potential Impacts - It is anticipated that surface mining operations will only extend down to groundwater levels. Thus, no adverse impact is expected on the groundwater table through this mining operation. As the mining is carried to its logical conclusion, the surface mine pit could be used as a recharge basin.

Groundwater use on the property will have a negligible impact on local groundwater levels. This operation contrasts with the effect of a riverine sand and gravel operation.

Mitigation of Impacts - Due to the proposed operation having no negative impacts upon the groundwater, mitigation is unnecessary and inappropriate.

<u>Surface and Subsurface Water Quality</u>

Existing Conditions - The streamflows in the Temescal Wash are typically ephemeral, although urban irrigation runoff does provide some non-seasonal flow. Flows are also seasonal according to the winter runoff and water levels in Lake Elsinore. For example, in the early 1980's which are considered wet years, Lake Elsinore contributed to the flow in Temescal Wash by its overflows. However, in the years after 1983, the lake level dropped and flows in Temescal Wash reflect normal runoff patterns for normal to dryer years.

The remainder of the site is only subject to runoff which may occur naturally. The qualities of this stormwater runoff is not considered hazardous or detrimental to the environment.

Potential Impacts - Although a portion of the subject property is located within the Temescal Wash, no significant alteration of streamflow patterns is anticipated. During the proposed quarry operations, adequate steps will be taken to maintain the existing positive drainage pattern of the floodplain portion of the site. There will be no adverse drainage effects on adjacent property as a result of the proposed quarry operations.

Water for production uses only will be used on-site to wash those aggregates which will be used in concrete. All other aggregates are produced without utilizing water, except as necessary for dust control. The average use is expected to be approximately 1,500 gallons per minute while washing aggregates. This water will be recycled. The anticipated total water loss from aggregate absorption and evaporation is estimated to range between 10,000 and 40,000 gallons per operating day during the first few years of operation.

The sources of operational water may include surface water, on-site wells and municipal waters if required. The most logical source for water supplies for plant operations will be obtained from within the local extraction site, or from surface water diversions. However, it is not believed that any such diversions would exceed the amounts to which CalMat Company would be entitled under its existing groundwater surface water rights or its correlative groundwater rights. It is not contemplated that any surface water diversions would be carried out under the appropriate doctrine, and therefore subject to the jurisdiction of the State Water Resources Control Board, except for required notices.

Disposal of wastewater will not be necessary, as all production water will be recycled. This recycled water will contain natural soils and fines washed from the aggregates. These materials, which are not toxic, will be settled out in a pond and the water reused. It is anticipated that the large pond located at the southwest corner of the project site will be used for settling. Other ponds may need to be contructed if future operations dictate.

Some toxic substances will be used in the production of asphalt and concrete on-site, including diesel oil, lubricants, concrete admixtures, asphalt and other items. However, none of these will be used or stored in such a way as to possibly contaminate surfacewater or groundwater. Additionally, no toxic disposal will occur on the site.

Mitigation of Impacts - Since no detrimental impacts are anticipated on either surface water quality or groundwater quality, no mitigation measures are necessary. Mining operations will proceed in such a manner as not to contaminate either surface water sources or groundwater. The usage of any toxic substances will be contained within specific facilities.

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1*************************************************** 
*  WATER SURFACE PROFILES                           *
*  VERSION OF NOVEMBER 1976                         *
*  UPDATED MAY 1984                                 *
*  IBM-PC-XT VERSION AUGUST 1985                    *
*  RUN DATE  07-03-87   TIME  10:03:02              *
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*  U.S. ARMY CORPS OF ENGINEERS     *
*  THE HYDROLOGIC ENGINEERING CENTER *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616          *
*  (916) 440-2105 (FTS) 448-2105    *
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X     X  XXXXXXX   XXXXX          XXXXX
X     X  X        X     X        X     X
X     X  X        X                    X
XXXXXXX  XXXX     X        XXXXX   XXXXX
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X     X  XXXXXXX   XXXXX          XXXXXXX
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THIS RUN EXECUTED 07-03-87

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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T1 SUBCRITICAL ANALYSIS OF TEMESCAL WASH FOR CALMAT CO.FOR EXISTING
T2 GEOMETRY BY ROBERT H. BORN CONSULTING ENGINNEERS. JULY 1,1988.
T3 TEMESCAL WASH(SUBCRITIC)

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	0.	0.	0.	-1.000000	.00	.0	24000.	668.000	.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1.000	.000	.000	.000	.000	.000	-1.000	.000	.000	.000

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38.000	23.000	24.000	33.000	26.000	14.000	1.000	2.000	42.000	4.000

J5 LPRNT NUMSEC ********REQUESTED SECTION NUMBERS********

LPRNT	NUMSEC								
-10.000	-10.000	.000	.000	.000	.000	.000	.000	.000	.000

NC	.025	.025	.025	.100	.300	.000	.000	.000	.000	.000
X1	.000	35.000	8.000	1650.000	.000	.000	.000	.000	.000	.000
X3	.000	.000	.000	1395.000	675.000	.000	.000	.000	.000	.000

GR	680.000	55.000	685.000	62.000	690.000	79.000	685.000	88.000	680.000	360.000
GR	675.000	698.000	670.000	705.000	665.000	715.000	665.000	730.000	665.000	772.000
GR	665.000	814.000	670.000	820.000	675.000	833.000	675.000	1195.000	675.000	1320.000
GR	675.000	1395.000	670.000	1410.000	665.000	1417.000	660.000	1455.000	660.000	1512.000
GR	660.000	1545.000	660.000	1567.000	665.000	1595.000	670.000	1608.000	675.000	1615.000
GR	680.000	1620.000	685.000	1629.000	690.000	1638.000	695.000	1650.000	700.000	1895.000
X1	2.350	24.000	11.000	1531.000	235.000	235.000	235.000	.000	.000	.000
X3	.000	.000	.000	980.000	677.000	.000	.000	.000	.000	.000
GR	700.000	.000	695.000	11.000	690.000	19.000	685.000	32.000	685.000	58.000
GR	680.000	75.000	680.000	78.000	675.000	580.000	670.000	595.000	670.000	668.000
GR	675.000	692.000	677.000	980.000	675.000	1129.000	670.000	1185.000	665.000	1203.000
GR	663.000	1370.000	665.000	1495.000	670.000	1503.000	675.000	1512.000	680.000	1519.000
GR	685.000	1524.000	690.000	1530.000	695.000	1531.000	700.000	1618.000	.000	.000
X1	4.650	39.000	8.000	1650.000	230.000	230.000	230.000	.000	.000	.000
X3	.000	.000	.000	750.000	680.000	.000	.000	.000	.000	.000
GR	725.000	.000	720.000	8.000	715.000	16.000	710.000	24.000	705.000	32.000
GR	700.000	40.000	695.000	60.000	690.000	70.000	690.000	75.000	685.000	100.000
GR	680.000	315.000	680.000	360.000	680.000	420.000	680.000	505.000	675.000	542.000
GR	670.000	555.000	670.000	575.000	675.000	660.000	680.000	665.000	680.000	750.000
GR	679.000	820.000	670.000	1125.000	665.000	1142.000	665.000	1210.000	670.000	1220.000

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GR	675.000	1229.000	680.000	1237.000	685.000	1257.000	690.000	1269.000	690.000	1304.000
GR	690.000	1410.000	695.000	1430.000	700.000	1470.000	700.000	1560.000	707.000	1590.000
GR	710.000	1618.000	715.000	1636.000	720.000	1650.000	725.000	1662.000	.000	.000
X1	7.050	39.000	10.000	1483.000	240.000	240.000	240.000	.000	.000	.000
X3	.000	.000	.000	758.000	685.000	.000	.000	.000	.000	.000
GR	725.000	.000	720.000	10.000	715.000	20.000	710.000	32.000	705.000	43.000
GR	700.000	53.000	695.000	62.000	690.000	67.000	685.000	123.000	685.000	258.000
GR	685.000	500.000	680.000	507.000	678.000	570.000	680.000	612.000	685.000	620.000
GR	685.000	758.000	680.000	760.000	675.000	770.000	670.000	795.000	665.000	920.000
GR	665.000	930.000	670.000	950.000	675.000	970.000	680.000	988.000	685.000	1000.000
GR	690.000	1035.000	690.000	1120.000	685.000	1132.000	685.000	1195.000	685.000	1218.000
GR	685.000	1300.000	690.000	1398.000	695.000	1407.000	700.000	1417.000	705.000	1420.000
GR	710.000	1425.000	715.000	1430.000	720.000	1483.000	725.000	1494.000	.000	.000
X1	8.850	33.000	10.000	1528.000	180.000	180.000	180.000	.000	.000	.000
GR	725.000	.000	720.000	10.000	715.000	22.000	710.000	38.000	705.000	48.000
GR	700.000	58.000	695.000	73.000	690.000	86.000	685.000	535.000	680.000	546.000
GR	675.000	558.000	675.000	690.000	675.000	725.000	670.000	750.000	670.000	783.000
GR	670.000	830.000	670.000	846.000	675.000	888.000	695.000	908.000	695.000	930.000
GR	695.000	990.000	695.000	1100.000	695.000	1120.000	680.000	1467.000	685.000	1473.000
GR	690.000	1482.000	695.000	1490.000	700.000	1497.000	705.000	1505.000	710.000	1510.000
GR	715.000	1520.000	720.000	1528.000	725.000	1535.000	.000	.000	.000	.000
X1	11.750	32.000	8.000	1565.000	290.000	290.000	290.000	.000	.000	.000
X3	.000	.000	.000	540.000	685.000	.000	.000	.000	.000	.000
GR	725.000	.000	720.000	8.000	715.000	23.000	710.000	35.000	705.000	45.000
GR	700.000	54.000	695.000	70.000	690.000	75.000	685.000	485.000	680.000	495.000
GR	680.000	525.000	685.000	540.000	680.000	558.000	675.000	570.000	675.000	930.000
GR	695.000	944.000	685.000	1020.000	685.000	1070.000	690.000	1145.000	690.000	1168.000
GR	685.000	1190.000	685.000	1268.000	690.000	1415.000	695.000	1424.000	700.000	1432.000
GR	700.000	1470.000	700.000	1535.000	705.000	1542.000	710.000	1551.000	715.000	1558.000
GR	720.000	1565.000	725.000	1570.000	.000	.000	.000	.000	.000	.000
X1	14.000	37.000	15.000	1455.000	225.000	225.000	225.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	838.000	685.000	.000	.000	.000
GR	725.000	.000	720.000	15.000	715.000	22.000	710.000	32.000	705.000	42.000
GR	700.000	50.000	695.000	70.000	690.000	96.000	685.000	452.000	680.000	470.000
GR	675.000	505.000	675.000	585.000	675.000	640.000	680.000	670.000	680.000	674.000

GR	665.000	870.000	665.000	970.000	665.000	1030.000	660.000	1090.000	665.000	1289.000
GR	670.000	1300.000	675.000	1309.000	680.000	1311.000	685.000	1320.000	690.000	1400.000
GR	695.000	1408.000	700.000	1415.000	705.000	1425.000	710.000	1432.000	715.000	1450.000
GR	720.000	1455.000	725.000	1460.000	.000	.000	.000	.000	.000	.000
X1	16.150	46.000	12.000	1355.000	215.000	215.000	215.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	518.000	690.000	.000	.000	.000
GR	725.000	.000	720.000	12.000	715.000	24.000	710.000	35.000	705.000	48.000
GR	700.000	55.000	695.000	71.000	690.000	75.000	685.000	81.000	685.000	86.000
GR	690.000	95.000	690.000	105.000	685.000	120.000	685.000	430.000	680.000	443.000
GR	675.000	457.000	675.000	481.000	680.000	505.000	685.000	510.000	690.000	518.000
GR	685.000	532.000	685.000	580.000	685.000	725.000	680.000	729.000	675.000	732.000
GR	670.000	742.000	665.000	753.000	660.000	767.000	658.000	784.000	658.000	818.000
GR	660.000	978.000	660.000	1045.000	660.000	1100.000	665.000	1110.000	670.000	1115.000

GR	675.000	1125.000	680.000	1132.000	685.000	1142.000	690.000	1159.000	695.000	1250.000
GR	700.000	1308.000	705.000	1328.000	710.000	1340.000	715.000	1349.000	720.000	1355.000
GR	725.000	1365.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	18.500	38.000	10.000	1165.000	235.000	235.000	235.000	.000	.000	.000
GR	720.000	.000	715.000	10.000	712.000	20.000	708.000	30.000	704.000	40.000
GR	700.000	50.000	696.000	58.000	692.000	70.000	688.000	80.000	728.000	110.000
GR	680.000	130.000	676.000	145.000	672.000	162.000	672.000	225.000	676.000	228.000
GR	680.000	229.000	684.000	244.000	689.000	285.000	689.000	320.000	688.000	345.000
GR	688.000	375.000	684.000	385.000	680.000	396.000	676.000	410.000	676.000	496.000
GR	680.000	525.000	684.000	640.000	688.000	665.000	688.000	695.000	688.000	770.000
GR	692.000	785.000	696.000	875.000	700.000	920.000	704.000	940.000	708.000	1120.000
GR	712.000	1156.000	716.000	1165.000	720.000	1175.000	.000	.000	.000	.000
X1	19.000	40.000	8.000	1152.000	50.000	50.000	50.000	.000	.000	.000
GR	720.000	.000	716.000	8.000	712.000	15.000	708.000	23.000	704.000	31.000
GR	700.000	40.000	696.000	60.000	692.000	65.000	688.000	70.000	684.000	72.000
GR	682.000	78.000	678.000	80.000	674.000	82.000	672.000	100.000	693.000	140.000
GR	676.000	190.000	676.000	210.000	680.000	245.000	684.000	280.000	688.000	305.000
GR	692.000	345.000	688.000	375.000	684.000	380.000	680.000	383.000	676.000	396.000
GR	674.000	450.000	676.000	570.000	680.000	590.000	684.000	610.000	688.000	660.000
GR	692.000	690.000	696.000	785.000	700.000	810.000	704.000	840.000	708.000	860.000
GR	708.000	1060.000	708.000	1135.000	712.000	1148.000	716.000	1152.000	720.000	1160.000
X1	20.700	29.000	5.000	969.000	170.000	170.000	170.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	15.000	712.000	20.000
GR	708.000	28.000	704.000	35.000	700.000	42.000	696.000	50.000	692.000	58.000
GR	688.000	68.000	684.000	92.000	680.000	120.000	686.000	210.000	692.000	285.000
GR	692.000	290.000	688.000	350.000	688.000	390.000	688.000	562.000	692.000	640.000
GR	696.000	670.000	700.000	705.000	704.000	760.000	708.000	795.000	712.000	880.000
GR	716.000	900.000	720.000	955.000	724.000	969.000	728.000	991.000	.000	.000
X1	21.300	31.000	5.000	916.000	60.000	60.000	60.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	18.000	712.000	20.000
GR	708.000	28.000	704.000	30.000	700.000	32.000	696.000	45.000	692.000	54.000
GR	688.000	64.000	684.000	125.000	680.000	145.000	678.000	235.000	678.000	258.000
GR	680.000	270.000	684.000	280.000	688.000	290.000	694.000	320.000	688.000	355.000
GR	684.000	378.000	684.000	480.000	688.000	545.000	692.000	627.000	696.000	685.000
GR	700.000	715.000	704.000	745.000	708.000	780.000	720.000	895.000	724.000	916.000
GR	728.000	940.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	23.100	44.000	5.000	867.000	180.000	180.000	180.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	20.000	712.000	30.000
GR	708.000	40.000	704.000	50.000	700.000	55.000	696.000	68.000	692.000	80.000
GR	688.000	96.000	688.000	130.000	692.000	155.000	693.000	160.000	692.000	173.000
GR	688.000	192.000	684.000	200.000	680.000	210.000	678.000	230.000	678.000	340.000
GR	680.000	369.000	684.000	385.000	688.000	400.000	692.000	420.000	680.000	440.000

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  8.82   900.  .        I       W.E         .          .          .          L    M     .          .          .          .
         950.  .       .I       W.E         .          .          .          L    M     .          .          .          .
        1000.  .       . I      W. E        .          .          .          L    M     .          .          .          .
        1050.  .       .  I     W. E        .          .          .          L    M     .          .          .          .
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        1150.  .       .   I     W E        .          .          .          L    M     .          .          .          .
 11.75  1200.  .       .    I    W  E       .          .          .          L    M     .          .          .          .
        1250.  .       .    I    .W  E      .          .          .          L    M     .          .          .          .
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 14.00  1400.  .       .    I    .  W   E   .          .          .          L    M     .          .          .          .
        1450.  .       .    I    .    W  E  .          .          .          L    M     .          .          .          .
        1500.  .       .    I    .     W  E.           .          .          L    M     .          .          .          .
        1550.  .       .    I    .      W  E           .          .         .L    M     .          .          .          .
        1600.  .       .    I    .       W E           .          .          L    M     .          .          .          .
 16.15  1650.  .       .    I    .       W .E          .          .          L    M     .          .          .          .
        1700.  .       .   I     .      C W.E          .          .         L.   M      .          .          .          .
        1750.  .       .   I     .     C  W.E          .          .        L . M        .          .          .          .
        1800.  .       .  I      .    C    WE          .          .       L . M         .          .          .          .
 18.50  1850.  .       . I       .  C      .E          .          .      LR   M         .          .          .          .
 19.00  1900.  .       . I       . C       .E          .          .      L   M          .          .          .          .
        1950.  .       .   I     .   C     .WE         .          .        L . M        .          .          .          .
        2000.  .       .      I  .     C   .WE         .          .          .L   M     .          .          .          .
        2050.  .       .         I.         CW E       .          .          . L    M   .          .          .          .
 20.70  2100.  .       .         I          .W E       .          .          .  L    M  .          .          .          .
 21.30  2150.  .       .       I .      C . E          .          .          .  L    M  .          .          .          .
        2200.  .       .       I .     C  . E          .          .          .  L    M  .          .          .          .
        2250.  .       .       I .     C  . E          .          .          .  L    M  .          .          .          .
        2300.  .       .       I .     C  . WE         .          .          .  L    M  .          .          .          .
 23.10  2350.  .       .       I .     C  . WE         .          .          .  L    M  .          .          .          .
        2400.  .       .       I .     C  . WE         .          .          .   L    M.          .          .          .
        2450.  .       .         I.    C  . WE         .          .          .     L    M         .          .          .
        2500.  .       .         I.    C  . WE         .          .          .      L  .M         .          .          .
        2550.  .       .         I.    C  . WE         .          .          .       L . M        .          .          .
        2600.  .       .          I     C . WE         .          .          .         L   M      .          .          .
        2650.  .       .          I     C . WE         .          .          .          .L   M    .          .          .
        2700.  .       .         .I     C . WE         .          .          .          . L   M   .          .          .
        2750.  .       .         .I     C . WE         .          .          .          .  L   M  .          .          .
        2800.  .       .         .I     C . WE         .          .          .          .   L   M.          .          .
        2850.  .       .         . I     C. WE         .          .          .          .    L   M.         .          .
 28.55  2900.  .       .         . I     C. WE         .          .          .          .     L   M         .          .
        2950.  .       .         .  I    C. WE         .          .          .          .     L   M         .          .
        3000.  .       .         .  I     C WE         .          .          .          .     L   M         .          .
        3050.  .       .         .   I    .C W E       .          .          .          .     L   M         .          .
        3100.  .       .         .    I   .C W E       .          .          .          .     L   M         .          .
        3150.  .       .         .     I  . CW E       .          .          .          .     L   M         .          .
 31.90  3200.  .       .         .      I . W E        .          .          .          .     L   M         .          .
        3250.  .       .         .     I  .C  WE       .          .          .          .     L   M         .          .
        3300.  .       .         .    I   C    E       .          .          .          .     L   M         .          .
 33.10  3350.  .       .         .   I   C.    E       .          .          .          .     L   M         .          .
1
 07-03-87    10:03:02                                                                                          PAGE   5




                                                                            THIS RUN EXECUTED 07-03-87

 ****************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
 ****************************************************


 NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST
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TEMESCAL WASH(SUBCRITIC)

SUMMARY PRINTOUT

	SECNO	XLBEL	RBEL	K*CHSL	VCH	QCH	CWSEL	CRIWS	ELMIN	TOPWID
*	.000	695.00	695.00	.00	15.84	24000.00	669.24	669.24	660.00	194.96
	2.350	695.00	695.00	12.77	8.73	24000.00	672.78	669.87	663.00	354.07
*	4.650	720.00	720.00	8.70	13.44	24000.00	676.52	676.52	665.00	327.39
	7.050	720.00	720.00	.00	13.03	24000.00	677.61	676.20	665.00	214.66
*	8.850	720.00	720.00	27.78	13.25	24000.00	678.46	678.46	670.00	341.78
	11.750	720.00	720.00	17.24	11.99	24000.00	680.43	680.11	675.00	377.36
*	14.000	720.00	720.00	.00	15.26	24000.00	683.46	683.46	675.00	220.63
*	16.150	720.00	720.00	.00	12.57	24000.00	688.29	688.29	675.00	419.98
	18.500	715.00	716.00	-12.77	4.19	24000.00	690.87	682.51	672.00	664.63
	19.000	716.00	716.00	.00	3.96	24000.00	690.91	681.60	672.00	586.41
*	20.700	724.00	724.00	47.06	11.63	24000.00	691.02	691.02	680.00	528.70
	21.300	724.00	724.00	-33.33	5.32	24000.00	692.93	687.65	678.00	576.87
	23.100	724.00	724.00	.00	6.55	24000.00	692.88	686.55	678.00	462.84
	28.550	736.00	736.00	7.34	8.22	24000.00	693.11	688.80	682.00	325.14
	31.900	736.00	736.00	14.93	11.64	24000.00	693.02	692.73	687.00	420.33
	33.100	736.00	736.00	-25.00	5.57	24000.00	694.93	689.49	684.00	476.60

1

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= .000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 4.650 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4.650 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 8.850 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 8.850 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 14.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 14.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 16.150 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 16.150 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 20.700 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 20.700 PROFILE= 1 MINIMUM SPECIFIC ENERGY

THIS RUN EXECUTED 07-03-87

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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GR	704.000	590.000	708.000	600.000	712.000	605.000	716.000	620.000	720.000	630.000
GR	724.000	640.000	724.000	705.000	720.000	720.000	716.000	740.000	712.000	790.000
GR	716.000	812.000	720.000	840.000	724.000	867.000	728.000	900.000	.000	.000

X1	28.550	33.000	5.000	945.000	545.000	545.000	545.000	.000	.000	.000
GR	740.000	.000	736.000	5.000	732.000	10.000	728.000	20.000	724.000	25.000
GR	720.000	30.000	716.000	38.000	712.000	45.000	708.000	58.000	704.000	110.000
GR	700.000	120.000	696.000	123.000	692.000	135.000	688.000	147.000	684.000	150.000
GR	682.000	169.000	682.000	305.000	682.000	370.000	684.000	395.000	688.000	415.000
GR	692.000	421.000	696.000	550.000	700.000	590.000	704.000	650.000	708.000	710.000
GR	712.000	720.000	716.000	870.000	720.000	900.000	724.000	915.000	728.000	925.000
GR	732.000	935.000	736.000	945.000	740.000	960.000	.000	.000	.000	.000

X1	31.900	32.000	5.000	675.000	335.000	335.000	335.000	.000	.000	.000
GR	740.000	.000	736.000	5.000	732.000	8.000	728.000	12.000	724.000	20.000
GR	720.000	25.000	716.000	32.000	712.000	40.000	708.000	50.000	704.000	55.000
GR	700.000	65.000	696.000	70.000	692.000	80.000	688.000	90.000	688.000	124.000
GR	687.000	126.000	688.000	236.000	687.000	300.000	688.000	435.000	692.000	480.000
GR	696.000	550.000	700.000	565.000	704.000	610.000	708.000	620.000	712.000	630.000
GR	716.000	640.000	720.000	650.000	724.000	660.000	728.000	665.000	732.000	670.000
GR	736.000	675.000	740.000	690.000	.000	.000	.000	.000	.000	.000

X1	33.100	37.000	5.000	755.000	120.000	120.000	120.000	.000	.000	.000
GR	740.000	.000	736.000	5.000	732.000	10.000	728.000	15.000	724.000	20.000
GR	720.000	30.000	716.000	42.000	712.000	55.000	708.000	65.000	704.000	80.000
GR	700.000	105.000	696.000	130.000	692.000	155.000	688.000	185.000	684.000	210.000
GR	684.000	235.000	684.000	405.000	684.000	505.000	688.000	560.000	692.000	595.000
GR	696.000	620.000	700.000	630.000	704.000	650.000	705.000	655.000	704.000	670.000
GR	700.000	675.000	700.000	706.000	704.000	708.000	708.000	710.000	712.000	718.000
GR	716.000	720.000	720.000	725.000	724.000	730.000	728.000	744.000	732.000	748.000
GR	736.000	755.000	740.000	760.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

1
PROFILE FOR STREAM TEMESCAL WASH(SUBCRITIC)

PLOTTED POINTS (BY PRIORITY)-E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION   660.      670.      680.      690.      700.      710.      720.      730.      740.      750.
    SECNO   CUMDIS

      .00     0.  I        W.  E      .         .    L    M         .         .         .         .         .         .
             50.  .I       CW  E      .         .    L    M         .         .         .         .         .         .
            100.  .I        CW E      .         .    L    M         .         .         .         .         .         .
            150.  . I        CW  E    .         .    L    M         .         .         .         .         .         .
            200.  .  I      C W E     .         .    L    M         .         .         .         .         .         .
     2.35   250.  .  I      C  WE     .         .    L    M         .         .         .         .         .         .
            300.  .  I     .C  WE     .         .         L    M    .         .         .         .         .         .
            350.  .   I     .  CW E   .         .         .     L   .M        .         .         .         .         .
            400.  .   I     .   CW E  .         .         .         .L    M   .         .         .         .         .
            450.  .    I    .     W  E.         .         .         .      L  . M       .         .         .         .
     4.65   500.  .    I    .      W E.         .         .         .         L    M    .         .         .         .
            550.  .    I    .     CW  E         .         .         .         L    M    .         .         .         .
            600.  .    I    .     CW  E         .         .         .         L    M    .         .         .         .
            650.  .    I    .     CW  E         .         .         .         L    M    .         .         .         .
            700.  .    I    .     CW  E         .         .         .         L    M    .         .         .         .
     7.05   750.  .    I    .     C W E         .         .         .         L    M    .         .         .         .
            800.  .     I   .      CW .E        .         .         .         L    M    .         .         .         .
            850.  .       I .      CW .E        .         .         .         L    M    .         .         .         .
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          950.  .         .I      W.E       .         .         .         L    M    .         .         .         .
         1000.  .         . I     W. E      .         .         .         L    M    .         .         .         .
         1050.  .         .  I    W. E      .         .         .         L    M    .         .         .         .
         1100.  .         .  I     W E      .         .         .         L    M    .         .         .         .
         1150.  .         .   I    W E      .         .         .         L    M    .         .         .         .
  11.75  1200.  .         .    I   W  E     .         .         .         L    M    .         .         .         .
         1250.  .         .    I   .W  E    .         .         .         L    M    .         .         .         .
         1300.  .         .    I   . W  E   .         .         .         L    M    .         .         .         .
         1350.  .         .    I   . W   E  .         .         .         L    M    .         .         .         .
  14.00  1400.  .         .    I   . W   E .          .         .         L    M    .         .         .         .
         1450.  .         .    I   .    W E.          .         .         L    M    .         .         .         .
         1500.  .         .    I   .     W E.         .         .         L    M    .         .         .         .
         1550.  .         .    I   .      W E         .         .         L    M    .         .         .         .
         1600.  .         .    I   .       W E        .         .         L    M    .         .         .         .
  16.15  1650.  .         .    I   .       W .E       .         .         L    M    .         .         .         .
         1700.  .         .   I    .      C W.E       .         .        L.   M     .         .         .         .
         1750.  .         .   I    .     C  W.E       .         .       L .  M      .         .         .         .
         1800.  .         .  I     .    C    WE       .         .      L . M        .         .         .         .
  18.50  1850.  .         . I      .  C       .E      .         .    LR   M         .         .         .         .
  19.00  1900.  .         .I       . C        .E      .         .     L   M         .         .         .         .
         1950.  .         .   I    .   C      .WE     .         .       L . M       .         .         .         .
         2000.  .         .      I .     C  .WE       .         .         .L   M    .         .         .         .
         2050.  .         .        I.        CW E     .         .         .  L   M  .         .         .         .
  20.70  2100.  .         .        I        .W E      .         .         .   L   M .         .         .         .
  21.30  2150.  .         .       I .      C . E      .         .         .   L   M .         .         .         .
         2200.  .         .       I .     C  . E      .         .         .   L   M .         .         .         .
         2250.  .         .       I .     C  . E      .         .         .   L   M .         .         .         .
         2300.  .         .       I .     C  . WE     .         .         .   L   M .         .         .         .
  23.10  2350.  .         .       I .     C  . WE     .         .         .   L   M .         .         .         .
         2400.  .         .       I .     C  . WE     .         .         .    L   M.         .         .         .
         2450.  .         .        I.     C  . WE     .         .         .     L  M        .         .         .
         2500.  .         .        I.     C  . WE     .         .         .      L .M       .         .         .
         2550.  .         .        I.     C  . WE     .         .         .       L . M     .         .         .
         2600.  .         .         I      C . WE     .         .         .         L   M   .         .         .
         2650.  .         .         I      C . WE     .         .         .         .L   M  .         .         .
         2700.  .         .        .I      C . WE     .         .         .         . L   M .         .         .
         2750.  .         .        .I      C . WE     .         .         .         .  L   M .        .         .
         2800.  .         .        .I      C . WE     .         .         .         .   L   M.        .         .
         2850.  .         .        . I      C. WE     .         .         .         .    L   M.       .         .
  28.55  2900.  .         .        . I      C. WE     .         .         .         .     L   M       .         .
         2950.  .         .        .  I     C. WE     .         .         .         .     L   M       .         .
         3000.  .         .        .  I      .C WE    .         .         .         .     L   M       .         .
         3050.  .         .        .   I     .C W E   .         .         .         .     L   M       .         .
         3100.  .         .        .    I    .C W E   .         .         .         .     L   M       .         .
         3150.  .         .        .     I   . CW E   .         .         .         .     L   M       .         .
  31.90  3200.  .         .        .     I . W E      .         .         .         .     L   M       .         .
         3250.  .         .        .    I  .C  WE     .         .         .         .     L   M       .         .
         3300.  .         .        .   I    C    E    .         .         .         .     L   M       .         .
  33.10  3350.  .         .        .   I    C.   E    .         .         .         .     L   M       .         .
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07-03-87   10:03:02   PAGE 5

THIS RUN EXECUTED 07-03-87

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

TEMESCAL WASH(SUBCRITIC)

SUMMARY PRINTOUT

	SECNO	XLBEL	RBEL	K*CHSL	VCH	QCH	CWSEL	CRIWS	ELMIN	TOPWID
*	.000	695.00	695.00	.00	15.84	24000.00	669.24	669.24	660.00	194.96
	2.350	695.00	695.00	12.77	8.73	24000.00	672.78	669.87	663.00	354.07
*	4.650	720.00	720.00	8.70	13.44	24000.00	676.52	676.52	665.00	327.39
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*	16.150	720.00	720.00	.00	12.57	24000.00	688.29	688.29	675.00	419.98
	18.500	715.00	716.00	-12.77	4.19	24000.00	690.87	682.51	672.00	664.63
	19.000	716.00	716.00	.00	3.96	24000.00	690.91	681.60	672.00	586.41
*	20.700	724.00	724.00	47.06	11.63	24000.00	691.02	691.02	680.00	528.70
	21.300	724.00	724.00	-33.33	5.32	24000.00	692.93	687.65	678.00	576.87
	23.100	724.00	724.00	.00	6.55	24000.00	692.88	686.55	678.00	462.84
	28.550	736.00	736.00	7.34	8.22	24000.00	693.11	688.80	682.00	325.14
	31.900	736.00	736.00	14.93	11.64	24000.00	693.02	692.73	687.00	420.33
	33.100	736.00	736.00	-25.00	5.57	24000.00	694.93	689.49	684.00	476.60

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CAUTION SECNO= 20.700 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 20.700 PROFILE= 1 MINIMUM SPECIFIC ENERGY

THIS RUN EXECUTED 07-03-87

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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1*************************************************                    **************************************
*  WATER SURFACE PROFILES                        *                    *  U.S. ARMY CORPS OF ENGINEERS      *
*  VERSION OF NOVEMBER 1976                      *                    *  THE HYDROLOGIC ENGINEERING CENTER *
*  UPDATED MAY 1984                              *                    *  609 SECOND STREET, SUITE D        *
*  IBM-PC-XT VERSION AUGUST 1985                 *                    *  DAVIS, CALIFORNIA 95616           *
*  RUN DATE  07-03-87   TIME  09:56:22           *                     *  (916) 440-2105 (FTS) 448-2105
*************************************************                    **************************************


                              X     X  XXXXXXX   XXXXX          XXXXX
                              X     X  X        X     X        X     X
                              X     X  X        X                    X
                              XXXXXXX  XXXX     X        XXXXX  XXXXX
                              X     X  X        X              X
                              X     X  X        X     X        X
                              X     X  XXXXXXX   XXXXX         XXXXXXX
1
 07-03-87     09:56:22                                                                          PAGE    1


                                                                        THIS RUN EXECUTED 07-03-87

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
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  IBM-PC-XT VERSION AUGUST 1985
 ************************************************


 T1   SUPERCRITICAL ANALYSIS OF TEMESCAL WASH FOR EXISTING GEOMETRY.
 T2   PREPARED BY ROBERT H. BORN CONSULTING ENGINNEERS FOR CALMAT CO.
 T3       TEMESCAL WASH(SUPERCRIT)     JULY 1. 1988

 J1  ICHECK     INQ       NINV      IDIR      STRT     METRIC     HVINS      Q        WSEL       FQ

        0.        0.        0.        1. -1.000000      .00        .0    24000.   689.000      .000

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH       FN      ALLDC      IBW      CHNIM     ITRACE

      -1.000      .000      .000      .000      .000      .000    -1.000      .000      .000      .000

 J3  VARIABLE CODES FOR SUMMARY PRINTOUT

      38.000    23.000    24.000    33.000    26.000    14.000     1.000     2.000    42.000     4.000

 J5  LPRNT    NUMSEC                 ********REQUESTED SECTION NUMBERS********

     -10.000   -10.000      .000      .000      .000      .000      .000      .000      .000      .000

 NC       .025       .025       .025       .100       .300       .000       .000       .000       .000       .000
 X1     33.100     37.000      5.000    755.000    120.000    120.000    120.000       .000       .000       .000
 GR    740.000       .000    736.000      5.000    732.000     10.000    728.000     15.000    724.000     20.000
```

GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	700.000	105.000	696.000	130.000	692.000	155.000	688.000	185.000	684.000	210.000
GR	684.000	235.000	684.000	405.000	684.000	505.000	688.000	560.000	692.000	595.000
GR	696.000	620.000	700.000	630.000	704.000	650.000	705.000	655.000	704.000	670.000
GR	700.000	675.000	700.000	706.000	704.000	708.000	708.000	710.000	712.000	718.000
GR	716.000	720.000	720.000	725.000	724.000	730.000	728.000	744.000	732.000	748.000
GR	736.000	755.000	740.000	760.000	.000	.000	.000	.000	.000	.000
X1	31.900	32.000	5.000	675.000	335.000	335.000	335.000	.000	.000	.000
GR	740.000	.000	736.000	5.000	732.000	8.000	728.000	12.000	724.000	20.000
GR	720.000	25.000	716.000	32.000	712.000	40.000	708.000	50.000	704.000	55.000
GR	700.000	65.000	696.000	70.000	692.000	80.000	688.000	90.000	688.000	124.000
GR	687.000	126.000	688.000	236.000	687.000	300.000	688.000	435.000	692.000	480.000
GR	696.000	550.000	700.000	565.000	704.000	610.000	708.000	620.000	712.000	630.000
GR	716.000	640.000	720.000	650.000	724.000	660.000	728.000	665.000	732.000	670.000
GR	736.000	675.000	740.000	690.000	.000	.000	.000	.000	.000	.000
X1	28.550	33.000	5.000	945.000	545.000	545.000	545.000	.000	.000	.000
GR	740.000	.000	736.000	5.000	732.000	10.000	728.000	20.000	724.000	25.000
GR	720.000	30.000	716.000	38.000	712.000	45.000	708.000	58.000	704.000	110.000
GR	700.000	120.000	696.000	123.000	692.000	135.000	688.000	147.000	684.000	150.000
GR	682.000	169.000	682.000	305.000	682.000	370.000	684.000	395.000	688.000	415.000
GR	692.000	421.000	696.000	550.000	700.000	590.000	704.000	650.000	708.000	710.000

GR	712.000	720.000	716.000	870.000	720.000	900.000	724.000	915.000	728.000	925.000
GR	732.000	935.000	736.000	945.000	740.000	960.000	.000	.000	.000	.000
X1	23.100	44.000	5.000	867.000	180.000	180.000	180.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	20.000	712.000	30.000
GR	708.000	40.000	704.000	50.000	700.000	55.000	696.000	68.000	692.000	80.000
GR	688.000	96.000	688.000	130.000	692.000	155.000	693.000	160.000	692.000	173.000
GR	688.000	192.000	684.000	200.000	680.000	210.000	678.000	230.000	678.000	340.000
GR	680.000	369.000	684.000	385.000	688.000	400.000	692.000	420.000	680.000	440.000
GR	680.000	455.000	692.000	470.000	692.000	540.000	696.000	550.000	700.000	574.000
GR	704.000	590.000	708.000	600.000	712.000	605.000	716.000	620.000	720.000	630.000
GR	724.000	640.000	724.000	705.000	720.000	720.000	716.000	740.000	712.000	790.000
GR	716.000	812.000	720.000	840.000	724.000	867.000	728.000	900.000	.000	.000
X1	21.300	31.000	5.000	916.000	60.000	60.000	60.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	18.000	712.000	20.000
GR	708.000	28.000	704.000	30.000	700.000	32.000	696.000	45.000	692.000	54.000
GR	688.000	64.000	684.000	125.000	680.000	145.000	678.000	235.000	678.000	258.000
GR	680.000	270.000	684.000	280.000	688.000	290.000	694.000	320.000	688.000	355.000
GR	684.000	378.000	684.000	480.000	688.000	545.000	692.000	627.000	696.000	685.000
GR	700.000	715.000	704.000	745.000	708.000	780.000	720.000	895.000	724.000	916.000
GR	728.000	940.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	20.700	29.000	5.000	969.000	170.000	170.000	60.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	15.000	712.000	20.000
GR	708.000	28.000	704.000	35.000	700.000	42.000	696.000	50.000	692.000	58.000
GR	688.000	68.000	684.000	92.000	680.000	120.000	686.000	210.000	692.000	285.000
GR	692.000	290.000	688.000	350.000	688.000	390.000	688.000	562.000	692.000	640.000
GR	696.000	670.000	700.000	705.000	704.000	760.000	708.000	795.000	712.000	880.000
GR	716.000	900.000	720.000	955.000	724.000	969.000	728.000	991.000	.000	.000
X1	19.000	40.000	8.000	1152.000	50.000	50.000	50.000	.000	.000	.000
GR	720.000	.000	716.000	8.000	712.000	15.000	708.000	23.000	704.000	31.000
GR	700.000	40.000	696.000	60.000	692.000	65.000	688.000	70.000	684.000	72.000
GR	682.000	78.000	678.000	80.000	674.000	82.000	672.000	100.000	693.000	140.000
GR	676.000	190.000	676.000	210.000	680.000	245.000	684.000	280.000	688.000	305.000
GR	692.000	345.000	688.000	375.000	684.000	380.000	680.000	383.000	676.000	396.000
GR	674.000	450.000	676.000	570.000	680.000	590.000	684.000	610.000	688.000	660.000
GR	692.000	690.000	696.000	785.000	700.000	810.000	704.000	840.000	708.000	860.000

THIS RUN EXECUTED 07-03-87

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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1**************************************************              **************************************
 * WATER SURFACE PROFILES                         *              * U.S. ARMY CORPS OF ENGINEERS
 * VERSION OF NOVEMBER 1976                       *              * THE HYDROLOGIC ENGINEERING CENTER
 * UPDATED MAY 1984                               *              * 609 SECOND STREET, SUITE D
 * IBM-PC-XT VERSION AUGUST 1985                  *              * DAVIS, CALIFORNIA 95616
 * RUN DATE  07-03-87   TIME  09:56:22             *              * (916) 440-2105 (FTS) 448-2105
 **************************************************              **************************************


                    X     X  XXXXXXX   XXXXX            XXXXX
                    X     X  X        X     X          X     X
                    X     X  X        X                      X
                    XXXXXXX  XXXX     X         XXXXX   XXXXX
                    X     X  X        X                X
                    X     X  X        X     X          X
                    X     X  XXXXXXX   XXXXX           XXXXXXX

1                                                                                          PAGE   1
 07-03-87    09:56:22


                                                                  THIS RUN EXECUTED 07-03-87

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION AUGUST 1985
 **************************************************


 T1  SUPERCRITICAL ANALYSIS OF TEMESCAL WASH FOR EXISTING GEOMETRY.
 T2  PREPARED BY ROBERT H. BORN CONSULTING ENGINNEERS FOR CALMAT CO.
 T3     TEMESCAL WASH(SUPERCRIT)     JULY 1. 1988

 J1  ICHECK    INQ      NINV      IDIR      STRT     METRIC    HVINS      Q       WSEL       FQ

       0.       0.       0.        1.  -1.000000     .00        .0    24000.   689.000     .000

 J2  NPROF     IPLOT    PRFVS     XSECV     XSECH      FN      ALLDC      IBW     CHNIM     ITRACE

     -1.000     .000     .000      .000      .000     .000    -1.000     .000      .000      .000

 J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38.000   23.000   24.000    33.000    26.000   14.000     1.000    2.000    42.000     4.000

 J5  LPRNT    NUMSEC            ********REQUESTED SECTION NUMBERS********

    -10.000  -10.000     .000      .000      .000     .000      .000     .000      .000      .000

 NC      .025     .025      .025      .100      .300      .000      .000      .000      .000      .000
 X1    33.100   37.000     5.000   755.000   120.000   120.000   120.000      .000      .000      .000
 GR   740.000     .000   736.000     5.000   732.000    10.000   728.000    15.000   724.000    20.000
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GR	700.000	105.000	696.000	130.000	692.000	155.000	688.000	185.000	684.000	210.000
GR	684.000	235.000	684.000	405.000	684.000	505.000	688.000	560.000	692.000	595.000
GR	696.000	620.000	700.000	630.000	704.000	650.000	705.000	655.000	704.000	670.000
GR	700.000	675.000	700.000	706.000	704.000	708.000	708.000	710.000	712.000	718.000
GR	716.000	720.000	720.000	725.000	724.000	730.000	728.000	744.000	732.000	748.000
GR	736.000	755.000	740.000	760.000	.000	.000	.000	.000	.000	.000
X1	31.900	32.000	5.000	675.000	335.000	335.000	335.000	.000	.000	.000
GR	740.000	.000	736.000	5.000	732.000	8.000	728.000	12.000	724.000	20.000
GR	720.000	25.000	716.000	32.000	712.000	40.000	708.000	50.000	704.000	55.000
GR	700.000	65.000	696.000	70.000	692.000	80.000	688.000	90.000	688.000	124.000
GR	687.000	126.000	688.000	236.000	687.000	300.000	688.000	435.000	692.000	480.000
GR	696.000	550.000	700.000	565.000	704.000	610.000	708.000	620.000	712.000	630.000
GR	716.000	640.000	720.000	650.000	724.000	660.000	728.000	665.000	732.000	670.000
GR	736.000	675.000	740.000	690.000	.000	.000	.000	.000	.000	.000
X1	28.550	33.000	5.000	945.000	545.000	545.000	545.000	.000	.000	.000
GR	740.000	.000	736.000	5.000	732.000	10.000	728.000	20.000	724.000	25.000
GR	720.000	30.000	716.000	38.000	712.000	45.000	708.000	58.000	704.000	110.000
GR	700.000	120.000	696.000	123.000	692.000	135.000	688.000	147.000	684.000	150.000
GR	682.000	169.000	682.000	305.000	682.000	370.000	684.000	395.000	688.000	415.000
GR	692.000	421.000	696.000	550.000	700.000	590.000	704.000	650.000	708.000	710.000

GR	712.000	720.000	716.000	870.000	720.000	900.000	724.000	915.000	728.000	925.000
GR	732.000	935.000	736.000	945.000	740.000	960.000	.000	.000	.000	.000
X1	23.100	44.000	5.000	867.000	180.000	180.000	180.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	20.000	712.000	30.000
GR	708.000	40.000	704.000	50.000	700.000	55.000	696.000	68.000	692.000	80.000
GR	688.000	96.000	688.000	130.000	692.000	155.000	693.000	160.000	692.000	173.000
GR	688.000	192.000	684.000	200.000	680.000	210.000	678.000	230.000	678.000	340.000
GR	680.000	369.000	684.000	385.000	688.000	400.000	692.000	420.000	680.000	440.000
GR	680.000	455.000	692.000	470.000	692.000	540.000	696.000	550.000	700.000	574.000
GR	704.000	590.000	708.000	600.000	712.000	605.000	716.000	620.000	720.000	630.000
GR	724.000	640.000	724.000	705.000	720.000	720.000	716.000	740.000	712.000	790.000
GR	716.000	812.000	720.000	840.000	724.000	867.000	728.000	900.000	.000	.000
X1	21.300	31.000	5.000	916.000	60.000	60.000	60.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	18.000	712.000	20.000
GR	708.000	28.000	704.000	30.000	700.000	32.000	696.000	45.000	692.000	54.000
GR	688.000	64.000	684.000	125.000	680.000	145.000	678.000	235.000	678.000	258.000
GR	680.000	270.000	684.000	280.000	688.000	290.000	694.000	320.000	688.000	355.000
GR	684.000	378.000	684.000	480.000	688.000	545.000	692.000	627.000	696.000	685.000
GR	700.000	715.000	704.000	745.000	708.000	780.000	720.000	895.000	724.000	916.000
GR	728.000	940.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	20.700	29.000	5.000	969.000	170.000	170.000	60.000	.000	.000	.000
GR	728.000	.000	724.000	5.000	720.000	10.000	716.000	15.000	712.000	20.000
GR	708.000	28.000	704.000	35.000	700.000	42.000	696.000	50.000	692.000	58.000
GR	688.000	68.000	684.000	92.000	680.000	120.000	686.000	210.000	692.000	285.000
GR	692.000	290.000	688.000	350.000	688.000	390.000	688.000	562.000	692.000	640.000
GR	696.000	670.000	700.000	705.000	704.000	760.000	708.000	795.000	712.000	880.000
GR	716.000	900.000	720.000	955.000	724.000	969.000	728.000	991.000	.000	.000
X1	19.000	40.000	8.000	1152.000	50.000	50.000	50.000	.000	.000	.000
GR	720.000	.000	716.000	8.000	712.000	15.000	708.000	23.000	704.000	31.000
GR	700.000	40.000	696.000	60.000	692.000	65.000	688.000	70.000	684.000	72.000
GR	682.000	78.000	678.000	80.000	674.000	82.000	672.000	100.000	693.000	140.000
GR	676.000	190.000	676.000	210.000	680.000	245.000	684.000	280.000	688.000	305.000
GR	692.000	345.000	688.000	375.000	684.000	380.000	680.000	383.000	676.000	396.000
GR	674.000	450.000	676.000	570.000	680.000	590.000	684.000	610.000	688.000	660.000
GR	692.000	690.000	696.000	785.000	700.000	810.000	704.000	840.000	708.000	860.000

GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
X1	18.500	38.000	10.000	1165.000	235.000	235.000	235.000	.000	.000	.000
GR	720.000	.000	715.000	10.000	712.000	20.000	708.000	30.000	704.000	40.000
GR	700.000	50.000	696.000	58.000	692.000	70.000	688.000	80.000	728.000	110.000
GR	680.000	130.000	676.000	145.000	672.000	162.000	672.000	225.000	676.000	228.000
GR	680.000	229.000	684.000	244.000	689.000	285.000	689.000	320.000	688.000	345.000
GR	688.000	375.000	684.000	385.000	680.000	396.000	676.000	410.000	676.000	496.000
GR	680.000	525.000	684.000	640.000	688.000	665.000	688.000	695.000	688.000	770.000
GR	692.000	785.000	696.000	875.000	700.000	920.000	704.000	940.000	708.000	1120.000
GR	712.000	1156.000	716.000	1165.000	720.000	1175.000	.000	.000	.000	.000

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X1	16.150	46.000	12.000	1355.000	215.000	215.000	215.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	518.000	690.000	.000	.000	.000
GR	725.000	.000	720.000	12.000	715.000	24.000	710.000	35.000	705.000	48.000
GR	700.000	55.000	695.000	71.000	690.000	75.000	685.000	81.000	685.000	86.000
GR	690.000	95.000	690.000	105.000	685.000	120.000	685.000	430.000	680.000	443.000
GR	675.000	457.000	675.000	481.000	680.000	505.000	685.000	510.000	690.000	518.000
GR	685.000	532.000	685.000	580.000	685.000	725.000	680.000	729.000	675.000	732.000
GR	670.000	742.000	665.000	753.000	660.000	767.000	658.000	784.000	658.000	818.000
GR	660.000	978.000	660.000	1045.000	660.000	1100.000	665.000	1110.000	670.000	1115.000
GR	675.000	1125.000	680.000	1132.000	685.000	1142.000	690.000	1159.000	695.000	1250.000
GR	700.000	1308.000	705.000	1328.000	710.000	1340.000	715.000	1349.000	720.000	1355.000
GR	725.000	1365.000	.000	.000	.000	.000	.000	.000	.000	.000

X1	14.000	37.000	15.000	1455.000	225.000	225.000	225.000	.000	.000	.000
X3	.000	.000	.000	.000	.000	838.000	685.000	.000	.000	.000
GR	725.000	.000	720.000	15.000	715.000	22.000	710.000	32.000	705.000	42.000
GR	700.000	50.000	695.000	70.000	690.000	96.000	685.000	452.000	680.000	470.000
GR	675.000	505.000	675.000	585.000	675.000	640.000	680.000	670.000	680.000	674.000
GR	685.000	680.000	685.000	838.000	680.000	845.000	675.000	855.000	670.000	865.000
GR	665.000	870.000	665.000	970.000	665.000	1030.000	660.000	1090.000	665.000	1289.000
GR	670.000	1300.000	675.000	1309.000	680.000	1311.000	685.000	1320.000	690.000	1400.000
GR	695.000	1408.000	700.000	1415.000	705.000	1425.000	710.000	1432.000	715.000	1450.000
GR	720.000	1455.000	725.000	1460.000	.000	.000	.000	.000	.000	.000

X1	11.750	32.000	8.000	1565.000	290.000	290.000	290.000	.000	.000	.000
X3	.000	.000	.000	540.000	685.000	.000	.000	.000	.000	.000
GR	725.000	.000	720.000	8.000	715.000	23.000	710.000	35.000	705.000	45.000
GR	700.000	54.000	695.000	70.000	690.000	75.000	685.000	485.000	680.000	495.000
GR	680.000	525.000	685.000	540.000	680.000	558.000	675.000	570.000	675.000	930.000
GR	695.000	944.000	685.000	1020.000	685.000	1070.000	690.000	1145.000	690.000	1168.000
GR	685.000	1190.000	685.000	1268.000	690.000	1415.000	695.000	1424.000	700.000	1432.000
GR	700.000	1470.000	700.000	1535.000	705.000	1542.000	710.000	1551.000	715.000	1558.000
GR	720.000	1565.000	725.000	1570.000	.000	.000	.000	.000	.000	.000

X1	8.850	33.000	10.000	1528.000	180.000	180.000	180.000	.000	.000	.000
GR	725.000	.000	720.000	10.000	715.000	22.000	710.000	38.000	705.000	48.000
GR	700.000	58.000	695.000	73.000	690.000	86.000	685.000	535.000	680.000	546.000
GR	675.000	558.000	675.000	690.000	675.000	725.000	670.000	750.000	670.000	783.000
GR	670.000	830.000	670.000	846.000	675.000	888.000	695.000	908.000	695.000	930.000
GR	695.000	990.000	695.000	1100.000	695.000	1120.000	680.000	1467.000	685.000	1473.000
GR	690.000	1482.000	695.000	1490.000	700.000	1497.000	705.000	1505.000	710.000	1510.000
GR	715.000	1520.000	720.000	1528.000	725.000	1535.000	.000	.000	.000	.000

X1	7.050	39.000	10.000	1483.000	240.000	240.000	240.000	.000	.000	.000
X3	.000	.000	.000	758.000	685.000	.000	.000	.000	.000	.000
GR	725.000	.000	720.000	10.000	715.000	20.000	710.000	32.000	705.000	43.000
GR	700.000	53.000	695.000	62.000	690.000	67.000	685.000	123.000	685.000	258.000
GR	685.000	500.000	680.000	507.000	678.000	570.000	680.000	612.000	685.000	620.000
GR	685.000	758.000	680.000	760.000	675.000	770.000	670.000	795.000	665.000	920.000
GR	665.000	930.000	670.000	950.000	675.000	970.000	680.000	988.000	685.000	1000.000

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	685.000	1300.000	690.000	1398.000	695.000	1407.000	700.000	1417.000	705.000	1420.000
GR	710.000	1425.000	715.000	1430.000	720.000	1483.000	725.000	1494.000	.000	.000

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X1	4.650	39.000	8.000	1650.000	230.000	230.000	230.000	.000	.000	.000
X3	.000	.000	.000	750.000	680.000	.000	.000	.000	.000	.000
GR	725.000	.000	720.000	8.000	715.000	16.000	710.000	24.000	705.000	32.000
GR	700.000	40.000	695.000	60.000	690.000	70.000	690.000	75.000	685.000	100.000
GR	680.000	315.000	680.000	360.000	680.000	420.000	680.000	505.000	675.000	542.000
GR	670.000	555.000	670.000	575.000	675.000	660.000	680.000	665.000	680.000	750.000
GR	679.000	820.000	670.000	1125.000	665.000	1142.000	665.000	1210.000	670.000	1220.000
GR	675.000	1229.000	680.000	1237.000	685.000	1257.000	690.000	1269.000	690.000	1304.000
GR	690.000	1410.000	695.000	1430.000	700.000	1470.000	700.000	1560.000	707.000	1590.000
GR	710.000	1618.000	715.000	1636.000	720.000	1650.000	725.000	1662.000	.000	.000

X1	2.350	24.000	11.000	1531.000	235.000	235.000	235.000	.000	.000	.000
X3	.000	.000	.000	980.000	677.000	.000	.000	.000	.000	.000
GR	700.000	.000	695.000	11.000	690.000	19.000	685.000	32.000	685.000	58.000
GR	680.000	75.000	680.000	78.000	675.000	580.000	670.000	595.000	670.000	668.000
GR	675.000	692.000	677.000	980.000	675.000	1129.000	670.000	1185.000	665.000	1203.000
GR	663.000	1370.000	665.000	1495.000	670.000	1503.000	675.000	1512.000	680.000	1519.000
GR	685.000	1524.000	690.000	1530.000	695.000	1531.000	700.000	1618.000	.000	.000

X1	.000	35.000	8.000	1650.000	.000	.000	.000	.000	.000	.000
X3	.000	.000	.000	1395.000	675.000	.000	.000	.000	.000	.000
GR	700.000	.000	695.000	8.000	690.000	15.000	685.000	23.000	680.000	37.000
GR	680.000	55.000	685.000	62.000	690.000	79.000	685.000	88.000	680.000	360.000
GR	675.000	698.000	670.000	705.000	665.000	715.000	665.000	730.000	665.000	772.000
GR	665.000	814.000	670.000	820.000	675.000	833.000	675.000	1195.000	675.000	1320.000
GR	675.000	1395.000	670.000	1410.000	665.000	1417.000	660.000	1455.000	660.000	1512.000
GR	660.000	1545.000	660.000	1567.000	665.000	1595.000	670.000	1608.000	675.000	1615.000
GR	680.000	1620.000	685.000	1629.000	690.000	1638.000	695.000	1650.000	700.000	1885.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

1

PROFILE FOR STREAM TEMESCAL WASH(SUPERCRIT)

PLOTTED POINTS (BY PRIORITY)-E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION  660.     670.     680.     690.     700.     710.     720.     730.     740.     750.
  SECNO   CUMDIS

   33.10    0.  .        .        .  I    W E   .        .        .        .    L   M      .      .
           20.  .        .        .   I   W E   .        .        .        .    L   M      .      .
           40.  .        .        .   I   .W E  .        .        .        .    L   M      .      .
           60.  .        .        .    I  .W  E .        .        .        .    L   M      .      .
           80.  .        .        .    I  . W E .        .        .        .    L   M      .      .
          100.  .        .        .     I . W  E.        .        .        .    L   M      .      .
   31.90  120.  .        .        .     I .  W E.        .        .        .    L   M      .      .
          140.  .        .        .     I . W  E.        .        .        .    L   M      .      .
          160.  .        .        .    I  . W  E.        .        .        .    L   M      .      .
          180.  .        .        .    I  . W  E.        .        .        .    L   M      .      .
          200.  .        .        .    I  . W E .        .        .        .    L   M      .      .
          220.  .        .        .    I  .WC E .        .        .        .    L   M      .      .
          240.  .        .        .   I   .W  E .        .        .        .    L   M      .      .
          260.  .        .        .   I   .W  E .        .        .        .    L   M      .      .
          280.  .        .        .   I   WC  E .        .        .        .    L   M      .      .
          300.  .        .        .  I    WC  E .        .        .        .    L   M      .      .
          320.  .        .        .  I    W  E  .        .        .        .    L   M      .      .
          340.  .        .        .  I    WC  E .        .        .        .    L   M      .      .
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         380.  .         .         .  I     WC  E      .         .         .         .     L   M         .         .
         400.  .         .         .  I    WC.  E      .         .         .         .     L   M         .         .
         420.  .         .         .  I    WC.  E      .         .         .         .     L   M         .         .
         440.  .         .         . I     WC.  E      .         .         .         .     L   M         .         .
28.55    460.  .         .         . I     WC. E       .         .         .         .     L   M         .         .
         480.  .         .         . I     WC. E       .         .         .         .     L   M         .         .
         500.  .         .         . I     WC. E       .         .         .         .    L   M.         .         .
         520.  .         .         . I    W C. E       .         .         .         .   L    M.         .         .
         540.  .         .         .I     WC . E       .         .         .         .   L   M .         .         .
         560.  .         .         .I     WC . E       .         .         .         .   L   M .         .         .
         580.  .         .         .I     WC . E       .         .         .         .  L   M  .         .         .
         600.  .         .         .I     WC . E       .         .         .         .  L   M  .         .         .
         620.  .         .         .I     WC . E       .         .         .         . L   M   .         .         .
         640.  .         .         .I     WC . E       .         .         .         . L   M   .         .         .
         660.  .         .         .I     WC . E       .         .         .         . L   M   .         .         .
         680.  .         .         I      WC .E        .         .         .         .L   M    .         .         .
         700.  .         .         I      WC .E        .         .         .         .L   M    .         .         .
         720.  .         .         I      WC .E        .         .         .         L   M     .         .         .
         740.  .         .         I      WC .E        .         .         .         L   M     .         .         .
         760.  .         .         I      WC .E        .         .         .        L.  M      .         .         .
         780.  .         .         I      W  .E        .         .         .        L.  M      .         .         .
         800.  .         .         I      W  .E        .         .         .        L.  M      .         .         .
         820.  .         .        I.      W  .E        .         .         .       L . M       .         .         .
         840.  .         .        I.      W  .E        .         .         .       L . M       .         .         .
         860.  .         .        I.      W  .E        .         .         .      L  .M        .         .         .
         880.  .         .        I.      W  .E        .         .         .      L  .M        .         .         .
         900.  .         .        I.      W  E         .         .         .     L   M         .         .         .
         920.  .         .        I.      W  E         .         .         .     L   M         .         .         .
         940.  .         .       I .      W  E         .         .         .    L   M.         .         .         .
         960.  .         .       I .      W  E         .         .         .    L   M.         .         .         .
         980.  .         .       I .      W  E         .         .         .    L   M.         .         .         .
23.10   1000.  .         .       I .      W  E         .         .         .   L   M .         .         .         .
        1020.  .         .       I .      W  E         .         .         .   L   M .         .         .         .
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        1060.  .         .       I .      W  E         .         .         .   L   M .         .         .         .
        1080.  .         .       I .      W  E         .         .         .   L   M .         .         .         .
        1100.  .         .       I .      W  E         .         .         .   L   M .         .         .         .
        1120.  .         .       I .      W  E         .         .         .   L   M .         .         .         .
        1140.  .         .       I .      W  E         .         .         .   L   M .         .         .         .
        1160.  .         .       I .       W E         .         .         .   L   M .         .         .         .
21.30   1180.  .         .       I .       W E         .         .         .   L   M .         .         .         .
        1200.  .         .        I.        W.E        .         .         .   L   M .         .         .         .
        1220.  .         .        I.         W E       .         .         .   L   M .         .         .         .
20.70   1240.  .         .         I         .W E      .         .         .   L   M .         .         .         .
        1260.  .         .      I  .      WC . E.      .         .         .L   M    .         .         .         .
        1280.  .         .    I    .  W C    . E       .         .        L.  M      .         .         .         .
19.00   1300.  .         . I     W . C       .E        .         .     L   M         .         .         .         .
        1320.  .         . I      W. C       E         .         .     L   M         .         .         .         .
        1340.  .         . I      W. C      E.         .         .    LR   M         .         .         .         .
18.50   1360.  .         . I       W  C    E .         .         .    LR   M         .         .         .         .
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        1400.  .         .  I      .W C     E.         .         .     LR  .M        .         .         .         .
        1420.  .         .  I      . W C    E.         .         .     LR  .M        .         .         .         .
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        1480.  .         .   I     .   WC    E         .         .       L .  M      .         .         .         .
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        1520.  .         .   I     .    W    E         .         .       LR.  M      .         .         .         .
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        1560.  .         .    I    .      W  E         .         .        L.   M     .         .         .         .
        1580.  .         .    I    .       W .E        .         .         L    M    .         .         .         .
16.15   1600.  .         .    I    .       W .E        .         .         L    M    .         .         .         .
        1620.  .         .    I    .       W .E        .         .         L    M    .         .         .         .
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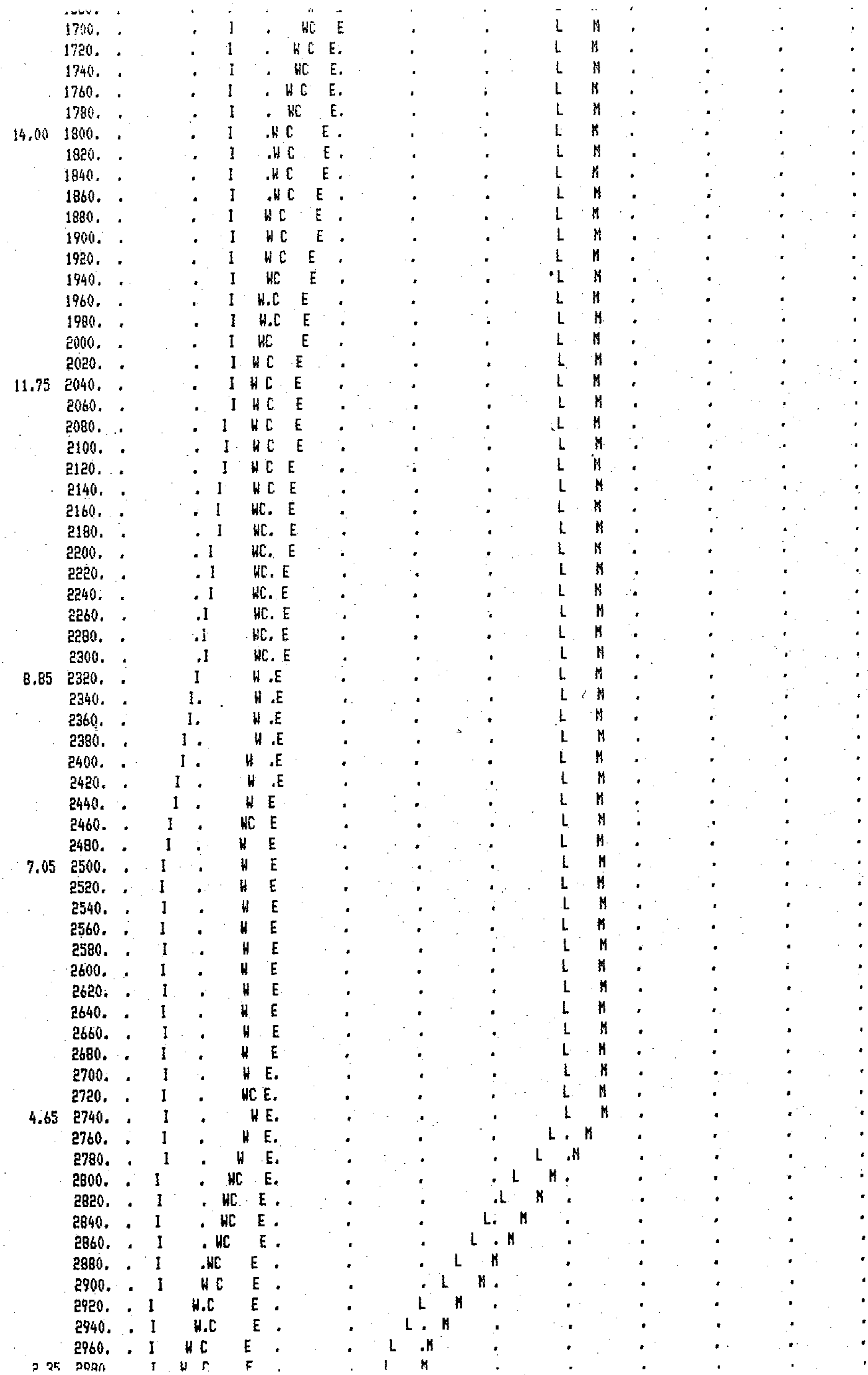

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   3180.  I       W.   E       .              .   L    M        .          .          .          .          .          .
.00 3200.  I       W.  E        .              .   L    M        .          .          .          .          .          .
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THIS RUN EXECUTED 07-03-87

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 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

TEMESCAL WASH(SUPERCRIT)

SUMMARY PRINTOUT

	SECNO	XLBEL	RBEL	K*CHSL	VCH	QCH	CWSEL	CRIWS	ELMIN	TOPWID
*	33.100	736.00	736.00	.00	12.50	24000.00	689.50	689.50	684.00	399.35
*	31.900	736.00	736.00	25.00	12.36	24000.00	692.73	692.73	687.00	414.52
	28.550	736.00	736.00	-14.93	17.62	24000.00	687.59	688.80	682.00	265.64
*	23.100	724.00	724.00	-7.34	14.97	24000.00	686.53	686.53	678.00	233.58
*	21.300	724.00	724.00	.00	12.43	24000.00	687.70	687.70	678.00	404.03
*	20.700	724.00	724.00	33.33	11.60	24000.00	691.04	691.04	680.00	529.26
	19.000	716.00	716.00	-133.33	28.74	24000.00	678.39	681.55	672.00	273.99
	18.500	715.00	716.00	.00	23.58	24000.00	679.70	682.52	672.00	223.56
*	16.150	720.00	720.00	12.77	12.66	24000.00	688.25	688.25	675.00	419.72
	14.000	720.00	720.00	.00	21.18	24000.00	681.43	683.47	675.00	210.84
	11.750	720.00	720.00	.00	19.44	24000.00	678.38	680.11	675.00	370.48
*	8.850	720.00	720.00	-17.24	13.25	24000.00	678.47	678.47	670.00	341.78
	7.050	720.00	720.00	-27.78	16.70	24000.00	675.68	676.17	665.00	203.81
*	4.650	720.00	720.00	.00	13.42	24000.00	676.53	676.53	665.00	327.74
	2.350	695.00	695.00	-8.70	23.82	24000.00	667.40	669.86	663.00	304.47

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION  SECNO=    31.900  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    31.900  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    31.900  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION  SECNO=    23.100  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    23.100  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION  SECNO=    21.300  PROFILE= 1  CRITICAL DEPTH ASSUMED
CAUTION  SECNO=    21.300  PROFILE= 1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION  SECNO=    21.300  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL

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CAUTION  SECNO=      .000  PROFILE= 1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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THIS RUN EXECUTED 07-03-87

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION AUGUST 1985
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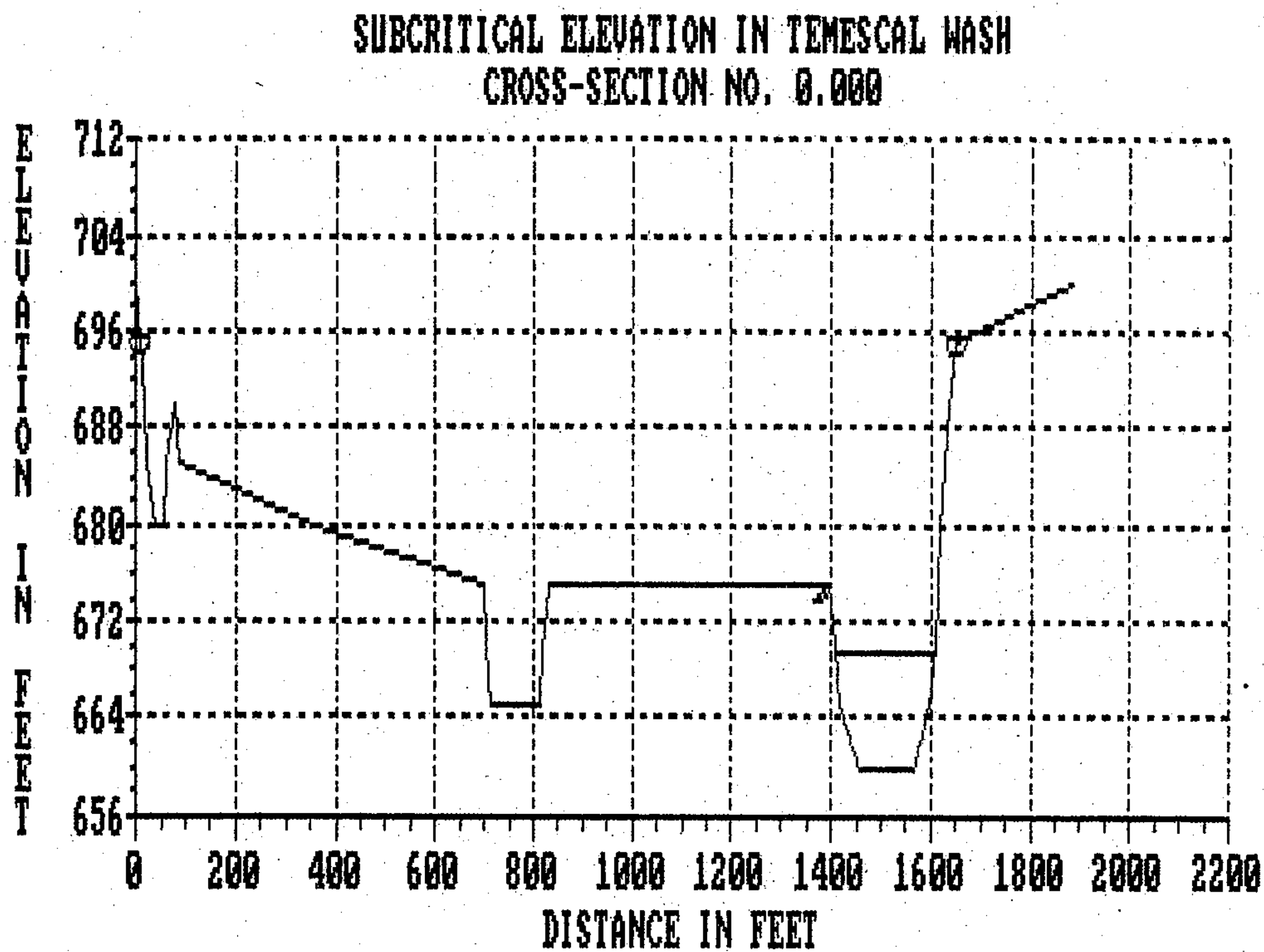
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CROSS-SECTION NO. 0.000
ELEVATION IN FEET
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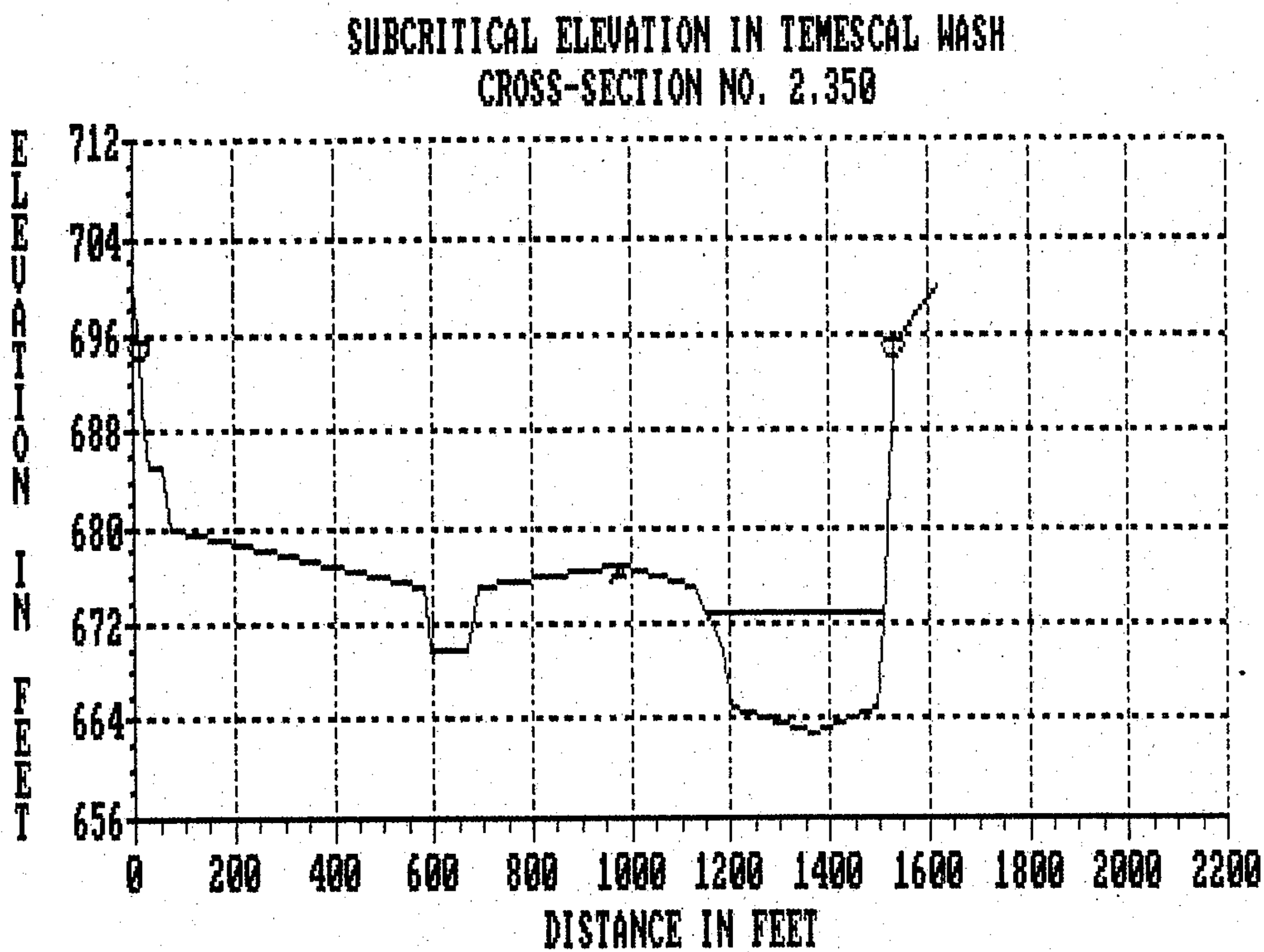
704
696
688
680
672
664
656
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
DISTANCE IN FEET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680
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0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
DISTANCE IN FEET

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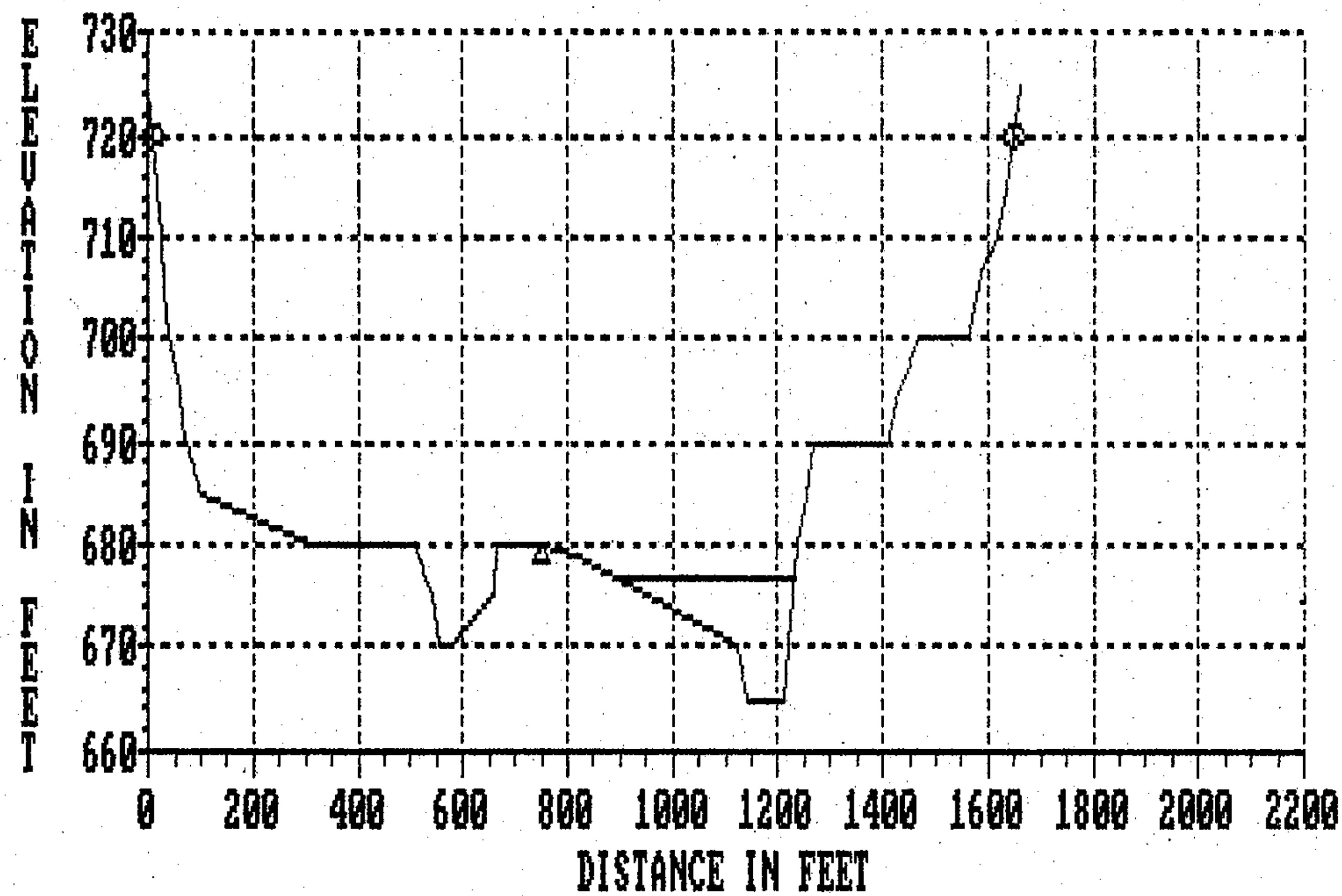

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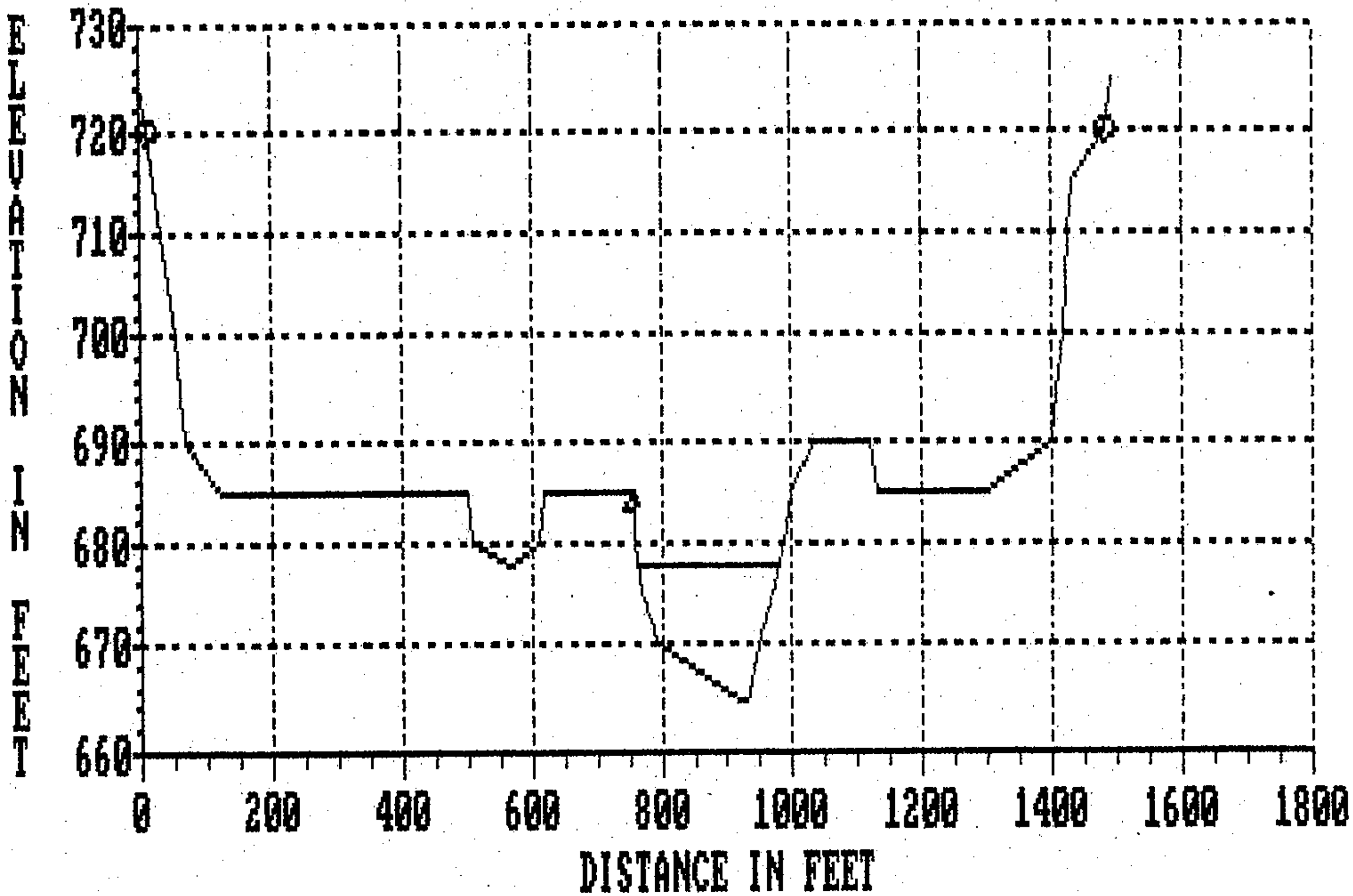

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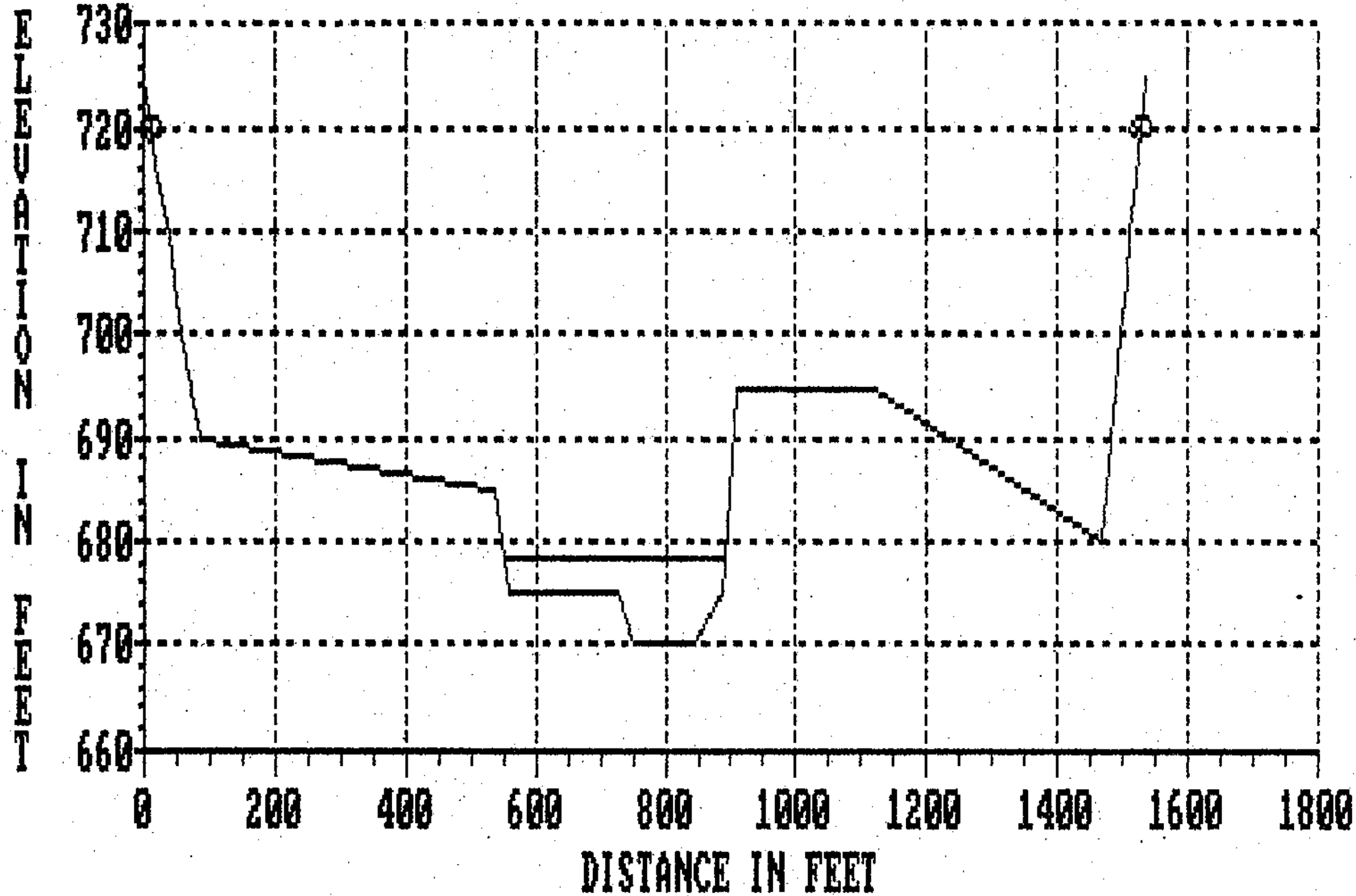
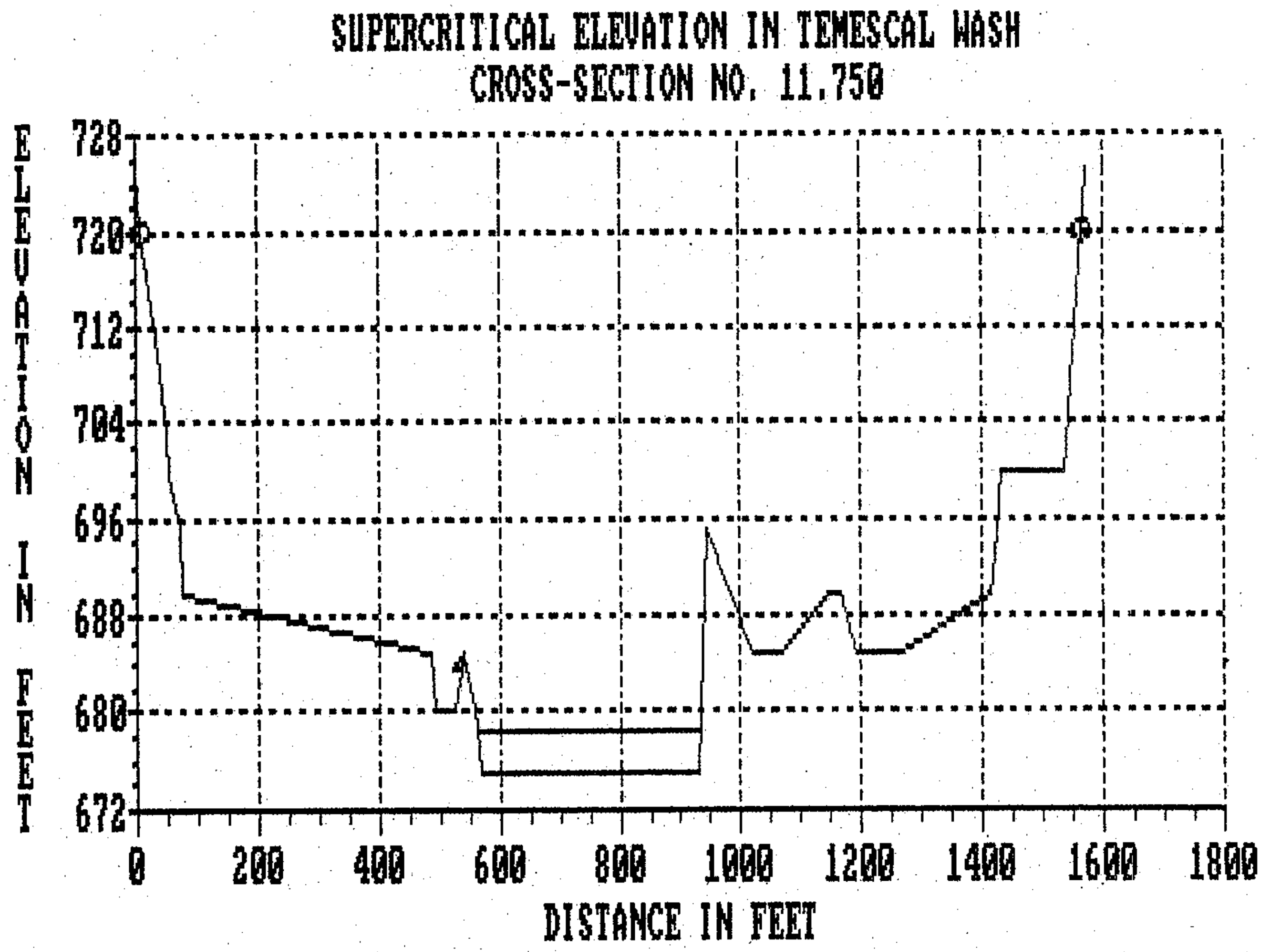
CROSS-SECTION NO. 8.850

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CROSS-SECTION NO. 11.750
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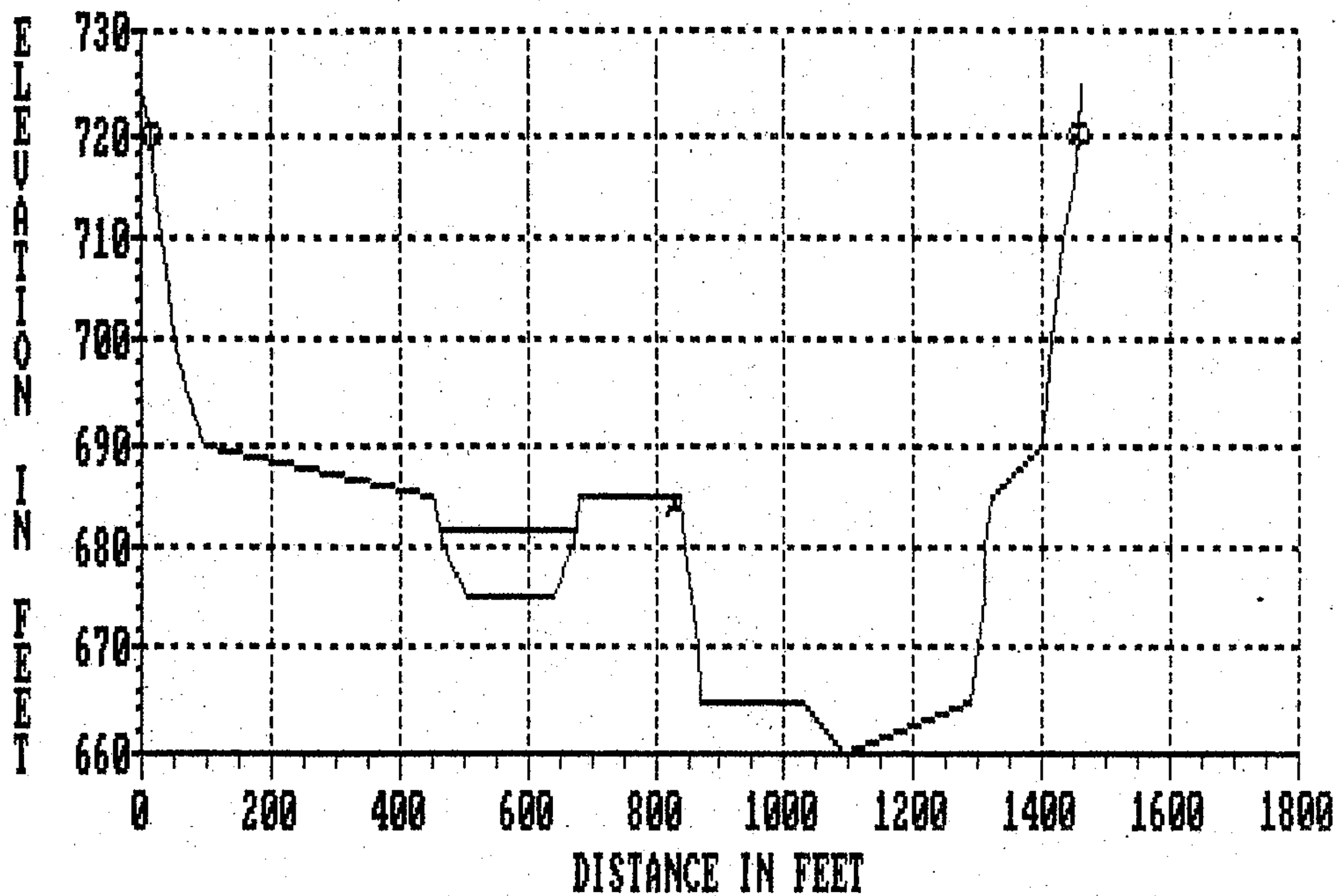
712
704
696
688
680
672
0
200
400
600
800
1000
1200
1400
1600
1800
DISTANCE IN FEET

SUPERCRITICAL ELEVATION IN TEMESCAL WASH
CROSS-SECTION NO. 14.000



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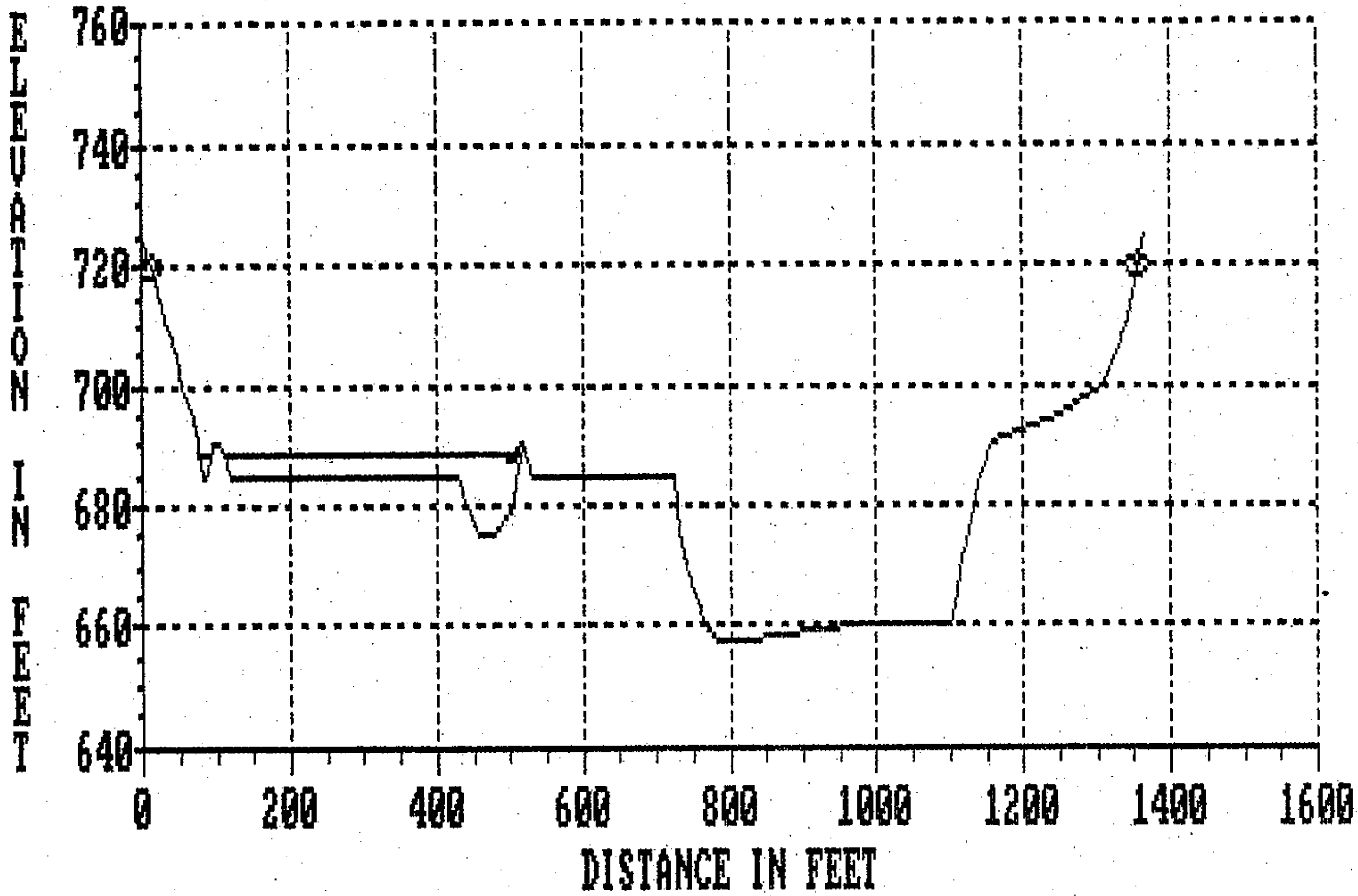


Appendix
5.6

Noise and Vibration Report

NOISE ASSESSMENT FOR THE CORONA QUARRY SURFACE MINING OPERATION COUNTY OF RIVERSIDE

Report #88-20-12PDW.a
February 8, 1989

Prepared By

Paul Dunholter, P.E.
William Bloomer
MESTRE GREVE ASSOCIATES
280 Newport Center Drive
Suite 230
Newport Beach, CA 92660-7528
714/760-0891

MESTRE GREVE ASSOCIATES
NOISE ASSESSMENT FOR THE CORONA QUARRY SURFACE MINING OPERATION
COUNTY OF RIVERSIDE

1.0 INTRODUCTION

The purpose of this report is to assess the potential noise impacts from the proposed Corona Quarry Surface Mining Operation. The project will be located in an unincorporated area of Riverside County east of Cajalco Street and south of Magnolia Avenue in the Corona area along the Temascal Wash. The project consists of the expansion of the existing minimally utilized 10-acre aggregate quarry to a larger 337 acre site. Existing mining operations in the area include All American Asphalt to the north, Fontana Paving operations to the south and Minnesota Mining and Manufacturing located one mile south of the site. The project site is exposed to noise levels from the freeway, railroad, roadways and current mining noise sources. The primary roadway noise sources in the project vicinity are Interstate 15 Freeway, Cajalco Street and Magnolia Avenue. The primary railroad noise source in the area is the Atchison, Topeka and Santa Fe Rail Road which runs along the west side of Cajalco southwest of the site.

Existing residences exist 1 mile north of the site along the north and south side of Magnolia Avenue (east of 6th Street) as well as half a mile southwest of the project east of the I-15 Freeway (north and south of Temescal Road). In addition there are existing apartments and current construction located .8 miles to the west along Rimpau Road, north of Old Temescal Road.

The project is expected to generate future noise levels at the surrounding areas from the surface mining operations. This report discusses background information on noise and community noise assessment criteria. This is intended to give the reader a greater understanding on noise and the criteria used to assess potential impacts from noise. The study will analyze the potential noise impact of the Corona Quarry Surface Mining Operation on adjacent land uses. These levels will then be compared with applicable County/State noise criteria and, if necessary, potential mitigation measures will be suggested.

2.0 BACKGROUND

2.1 Noise Definitions and Assessment Criteria

Sound is technically described in terms of the loudness (amplitude) of the sound and the frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter Scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud; and 20 dBA higher four times as loud; and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Noise level increases of less than 3 dBA are usually not considered significant. A noise level increase of 5 dBA will be readily noticeable to the human observer, although it will not be perceived as dramatically as a 10 dBA change. Examples of various sound levels in different environments are shown in Exhibit 1.

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption, and ground attenuation. The sound wave form travels away from the source, the sound energy is dispersed over a greater area dispersing the sound power of the wave. The interaction of the sound waves with the ground also affects the noise levels. Soft surfaces such as grass are more absorptive than hard surfaces such as concrete where the amount of noise reduction is less. Atmospheric absorption also influences the levels that are received by the observer. The greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, temperature and humidity also play a significant role in determining the degree of attenuation.

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. This criteria is based on such known effects of noise on people as hearing loss (not a factor with community noise), communication interference, sleep interference, physiological responses and annoyance. Each of these potential noise impacts on people are briefly discussed in the following narratives:

HEARING LOSS is, in general, not a concern in community noise problems. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments with long term exposure. The Occupational Safety and Health Administration (OSHA) identifies a noise exposure limit of 90 dBA for 8 hours per day to protect from hearing loss. Noise levels in neighborhoods, even in very noisy airport environments near major international airports, are not sufficiently loud to cause hearing loss.

COMMUNICATION INTERFERENCE is one of the primary concerns in environmental noise problems. Communication interference includes speech interference and activities such as watching television. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level

SLEEP INTERFERENCE is a major noise concern in community noise assessment and, of course, is most critical during nighttime hours. Sleep disturbance is one of the major causes of annoyance due to community noise. Noise can make it difficult to fall asleep, create momentary disturbances of natural sleep patterns by causing shifts from deep to lighter stages and cause awakening. Noise may even cause awakening which a person may or may not be able to recall. Extensive research has been conducted on the effect of noise on sleep disturbance. Recommended values for desired sound levels in residential bedroom space range from 25 to 45 dBA with 35 to 40 dBA being the norm. The National Association of Noise Control Officials has published data on the probability of sleep disturbance with various single event noise levels. Based on experimental sleep data as related to noise exposure, a 75 dBA interior noise level event will cause noise induced awakening in 30 percent of the cases.

PHYSIOLOGICAL RESPONSES are those measurable effects of noise on people which are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is not known to which these physiological

SOUND LEVELS AND LOUDNESS OF ILLUSTRATIVE NOISES IN INDOOR AND OUTDOOR ENVIRONMENTS

(A-Scale Weighted Sound Levels)

dB(A)	OVER-ALL LEVEL Sound Pressure Level Approx. 0.0002 Microbar	COMMUNITY (Outdoor)	HOME OR INDUSTRY	LOUDNESS Human Judgement of Different Sound Levels
130	UNCOMFORTABLY	Military Jet Aircraft Take-Off With After-burner From Aircraft Carrier @ 50 Ft. (130)	Oxygen Torch (121)	120 dB(A) 32 Times as Loud
120 110	LOUD	Turbo-Fan Aircraft @ Take Off Power @ 200 Ft. (90)	Riveting Machine (110) Rock-N-Roll Band (108-114)	110 dB(A) 16 Times as Loud
100	VERY	Jet Flyover @ 1000 Ft. (103) Boeing 707, DC-8 @ 6080 Ft. Before Landing (106) Bell J-2A Helicopter @ 100 Ft. (100)		100 dB(A) 8 Times as Loud
90	LOUD	Power Mower (96) Boeing 737, DC-9 @ 6080 Ft. Before Landing (97) Motorcycle @25 Ft. (90)	Newspaper Press (97)	90 dB(A) 4 Times as Loud
80		Car Wash @ 20 Ft. (89) Prop. Airplane Flyover @ 1000 Ft. (88) Diesel Truck, 40 MPH @ 50 Ft. (84) Diesel Train, 45 MPH @ 100 Ft. (83)	Food Blender (88) Milling Machine (85) Garbage Disposal (80)	80 dB(A) 2 Times as Loud
70	MODERATELY LOUD	High Urban Ambient Sound (80) Passenger Car, 65 MPH @ 25 Ft. (77) Freeway @ 50 Ft. From Pavement Edge, 10:00 AM (76 +or- 6)	Living Room Music (76) TV-Audio, Vacuum Cleaner	70 dB(A)
60		Air Conditioning Unit @ 100 Ft. (60)	Cash Register @ 10 Ft. (65-70) Electric Typewriter @ 10 Ft. (64) Dishwasher (Rinse) @ 10 Ft. (60) Conversation (60)	60 dB(A) 1/2 as Loud
50	QUIET	Large Transformers @ 100 Ft. (50)		50 dB(A) 1/4 as Loud
40		Bird Calls (44) Lower Limit Urban Ambient Sound (40)		40 dB(A) 1/8 as Loud
	JUST AUDIBLE	(dB(A) Scale Interrupted)		
10	THRESHOLD OF HEARING			

SOURCE: Reproduced from Melville C. Branch and R. Dale Beland, Outdoor Noise in the Metropolitan Environment. Published by the City of Los Angeles, 1970, p.2.

responses cause harm or are a sign of harm. Generally, physiological responses are a reaction to a loud short term noise such as a rifle shot or a very loud jet overflight.

ANNOYANCE is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability. The level of annoyance, of course, depends on the characteristics of the noise (i.e., loudness, frequency spectra, time, and duration), and how much activity interference (e.g. speech interference and sleep interference) results from the noise. However, the level of annoyance is also a function of the attitude of the receiver. Personal sensitivity to noise varies widely. It has been estimated that 2 to 10 percent of the population is highly susceptible to noise not of their own making, while approximately 20 percent are unaffected by noise. Attitudes are affected by the relationship between the person and the noise source. (Is it our dog barking or the neighbor's dog?) Whether we believe that someone is trying to abate the noise will also effect our level of annoyance.

2.2 Noise Assessment Metrics

The description, analysis and reporting of community noise levels is made difficult by the complexity of human response to noise and the myriad of noise metrics that have been developed for describing noise impacts. Each of these metrics attempt to quantify noise levels with respect to community response. Community noise is generally not steady state and varies with time. Under conditions of non-steady state noise, some type of statistical metric is necessary in order to quantify noise exposure over a long period of time. Several rating scales have been developed for describing the effects of noise on people. They are designed to account for the previously described known effects of noise on people.

2.2.1 Land Use Compatibility Analysis

The "equivalent noise level" or Leq is the average noise level on an energy basis for any specified time period. The Leq for one hour is the energy average noise level during the hour, specifically, the average noise based on the energy content (acoustic energy) of the sound. It can be thought of as the level of a continuous noise which has the same energy content as the fluctuating noise level. The equivalent noise level has the units of dBA, therefore, a sound measured for one hour may be expressed as a one hour Leq of for example 57 dBA.

The predominant rating scales now in use in California for land use compatibility assessment are the Community Noise Equivalent Level (CNEL) and the Day Night Level (Ldn). CNEL represents a time weighted 24 hour average noise level based on the A-weighted decibel. Time weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. The CNEL scale penalizes the evening time period (7 p.m. to 10 p.m.) noises by 5 dBA, while nighttime (10 p.m. to 7 a.m.) noises are penalized by 10 dBA. These time periods and penalties were selected to reflect people's increased sensitivity to noise during these time periods. Ldn is similar to CNEL except that the evening time period is not penalized. Typical noise levels in terms of the CNEL scale for different types of communities are presented in Exhibit 2. These scales are commonly used to assess traffic noise impacts.

State laws passed in the past few years now require that cities develop their Noise Elements in terms of the Ldn or CNEL scales. Both of these scales represent time weighted 24 hour average noise, and correlate much better to how people perceive their noise environment. The

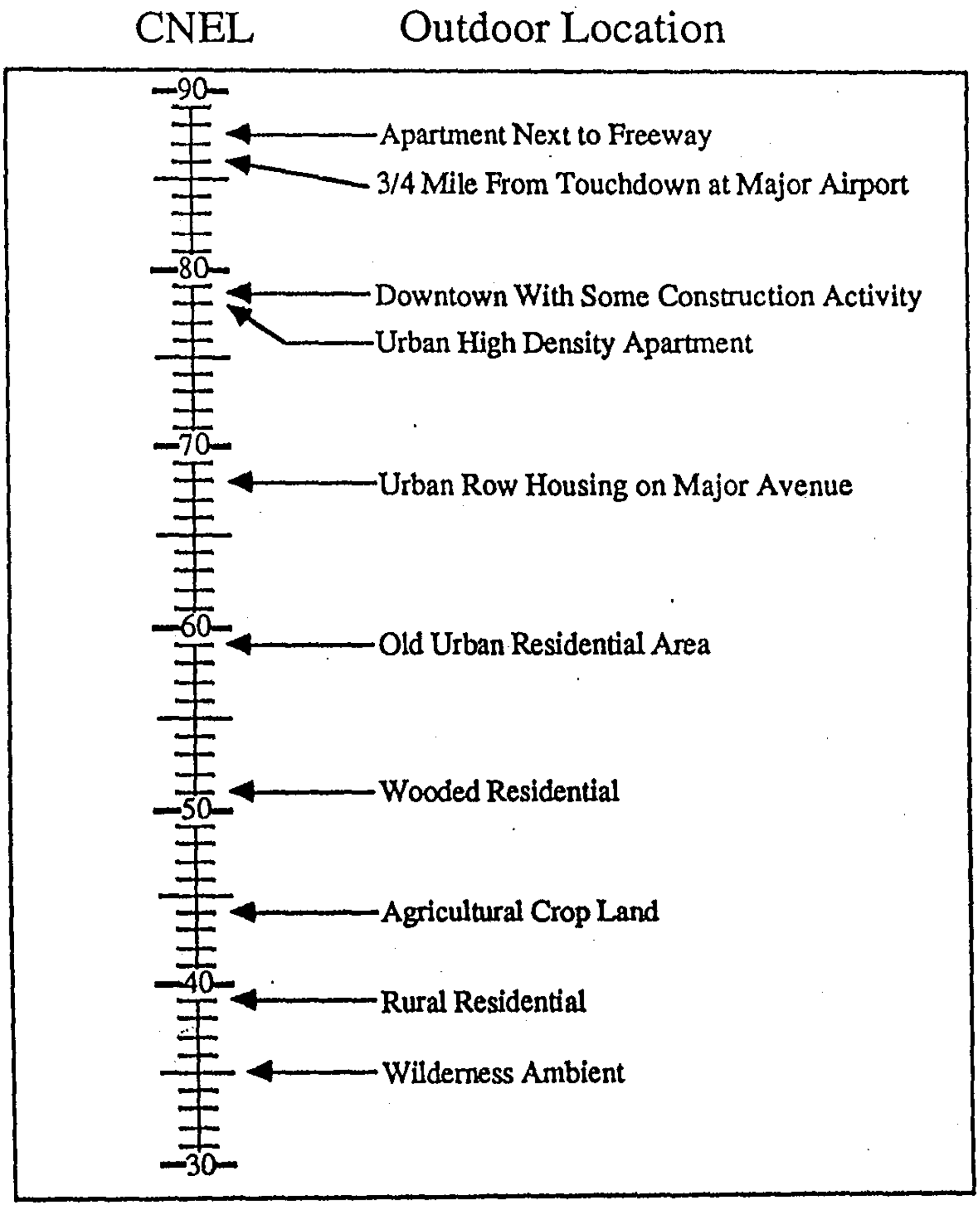


Exhibit 2
Typical Outdoor Levels

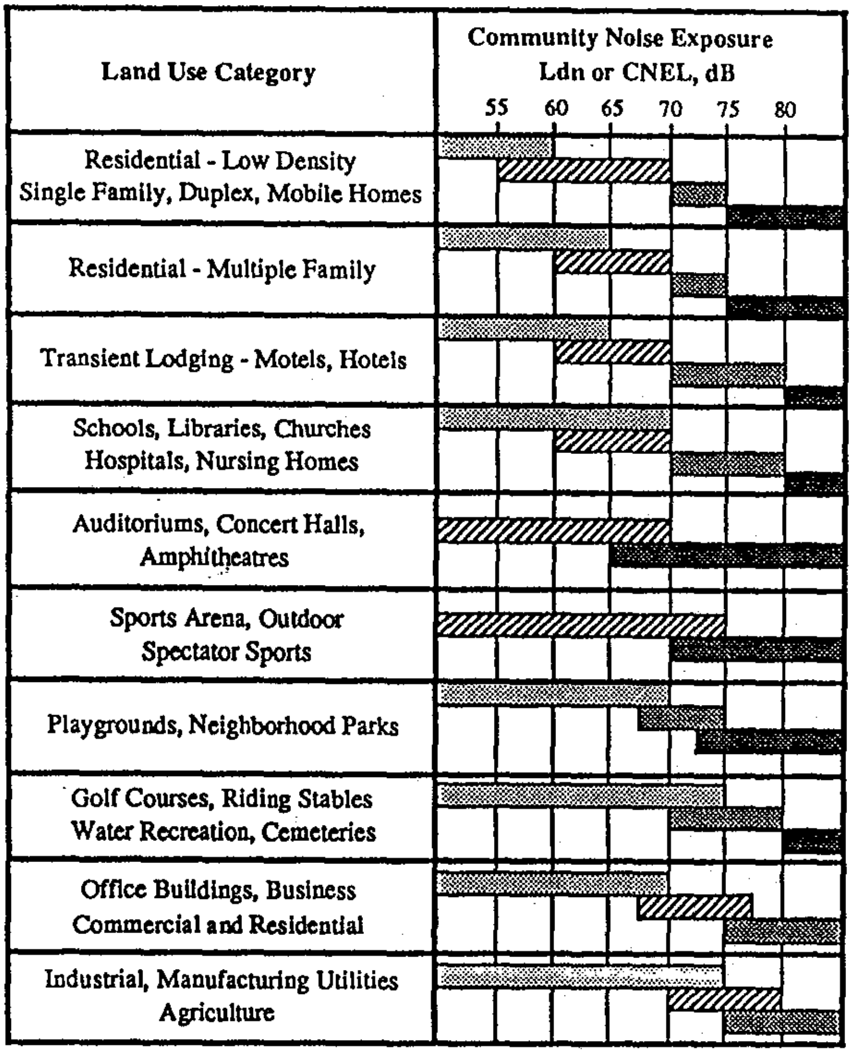
California Department of Health has established guidelines for assessing the compatibility of community noise environments and land uses in terms of CNEL. The guidelines rank noise and land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. These guidelines are summarized in Exhibit 3.

In addition, the California Noise Insulation Standards require that new multi-family residential construction should be noise insulated so that the interior noise levels do not exceed 45 CNEL. Most cities have adopted this standard for both single and multi-family developments along with a 65 CNEL standard for private outdoor living areas (e.g., rear yards and patio areas). These noise criteria are designed to minimize the impacts from transportation noise on residential land uses.

2.2.2 Community Noise Ordinances

Community noise levels are measured in terms of the "A-weighted decibel," abbreviated dBA. Intermittent or occasional noises such as those associated with certain types of mining operations are not of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the CNEL scale. A common method of characterizing these noise levels is with the "percent noise level" or L%. The percent noise level describes the noise level which is exceeded during a certain percentage of the measurement period. For example, L50 is the noise level exceeded 50 percent of the time and represents the average noise level. Similarly, L1 is the noise level exceeded 1 percent of the time and represents the peak noise level, and L90 is the noise level exceeded 90 percent of the time and represents the background noise level.

Riverside County does not have a noise ordinance that would apply to this project. The State of California Department of Health has developed a model noise ordinance that is used with noise sources such as blasting. This model noise ordinance establishes exterior noise standards. The ordinance is designed to protect residential areas from noise sources on private properties. Table 1 presents the noise standards contained in the model noise ordinance. The noise ordinance is designed to control unnecessary, excessive and annoying sounds from stationary sources at the private property line. The noise ordinance requirements can not be applied to mobile noise sources such as heavy trucks when traveling on public roadways. Control of the mobile noise sources on public roads is pre-empted by federal and State laws. The noise ordinance does not apply to motor vehicles on private property.



Interpretation

Normally Acceptable

Specified Land Use is Satisfactory, Based Upon the Assumption that Any Buildings Involved are of Normal Conventional Construction, Without Any Special Noise Insulation Requirements.

Conditionally Acceptable

New Construction or Development Should be Undertaken Only After a Detailed Analysis of the Noise Reduction Requirement is Made and Needed Noise Insulation Features Included in the Design. Conventional Construction, but with Closed Windows and Fresh Air Supply Systems or Air Conditioning, Will Normally Suffice.

Normally Unacceptable

New Construction or Development Should Generally be Discouraged. If New Construction or Development Does Proceed, a Detailed Analysis of the Noise Reduction Requirements Must be Made and Needed Noise Insulation Features Included in the Design.

Clearly Unacceptable

New Construction or Development Should Generally not be Undertaken.

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CONSULTING ENGINEERS

Exhibit 3 - California Land Use Compatibility Studies

TABLE 1
MODEL NOISE ORDINANCE STANDARDS

MAXIMUM TIME OF EXPOSURE	NOISE METRIC	NOISE LEVEL NOT TO BE EXCEEDED 7 a.m. to 10 p.m.	10 p.m. to 7 a.m.
30 Minutes/Hour	L50	50 dBA	45 dBA
15 Minutes/Hour	L25	55 dBA	50 dBA
5 Minutes/Hour	L8.3	60 dBA	55 dBA
1 Minute/Hour	L1.7	65 dBA	60 dBA

2.3 Existing Noise Levels

2.3.1 Noise Measurement Survey

Noise measurements were made at six locations in the vicinity of the proposed project area. The measurement locations are depicted in Exhibit 4. The daytime measurements were made on December 2, 1988 (a Friday) and on December 4, 1988 (a Sunday). The nighttime measurements were made at three locations early on February 9, 1989 (a Thursday). The monitoring times and locations are shown below in Table 2. The wind speeds during the time of the measurements were light (0 to 5 miles per hour).

Monitoring Site 1 and 5 are located southwest of the project site, east of the I-15 Freeway near Old Temescal Road within an existing residential area. Sites 2, 3 and 4 are also located within existing residences near Magnolia Avenue, northwest of the site. Site 6 is located west of Rimpau Road and the I-15 Freeway in an area where future homes are planned. Site 6 is currently undeveloped.

The measurements were made with a Bruel & Kjaer Type 4427 Sound Level Meter, and calibrated before and after each measurement series. Measurements were made for one fifteen minute period at each site. The composite results are presented in Table 3. The results are presented in terms of the equivalent noise levels (Leqs), minimum noise levels and percentile noise levels (L%). The L10 percentile level for example, represents the noise levels exceeded 10 percent of the time. Therefore the L1 and L10 levels represent the loudest noise levels generally experienced. For all six the sites monitored the loudest event was usually a car pass-by on the adjacent roadway for daytime measurement. The L90 levels represent the most quiet noise levels experienced, or the background noise levels. These daytime levels were usually due to distant traffic noise sources. A typical low daytime background level in this area is 40 dBA.

Nighttime noise sources included mining operations noise from existing mining operations sites and nearby industrial activities. The background noise was predominantly due to drilling and industrial operations. The peak sound levels were from aircraft overflights. The noise from the existing mining operations was in the low 40's dBA for the nearest residential land uses. The low background sound levels in the nighttime, without mining noise, is approximately 35 to 40 dBA.

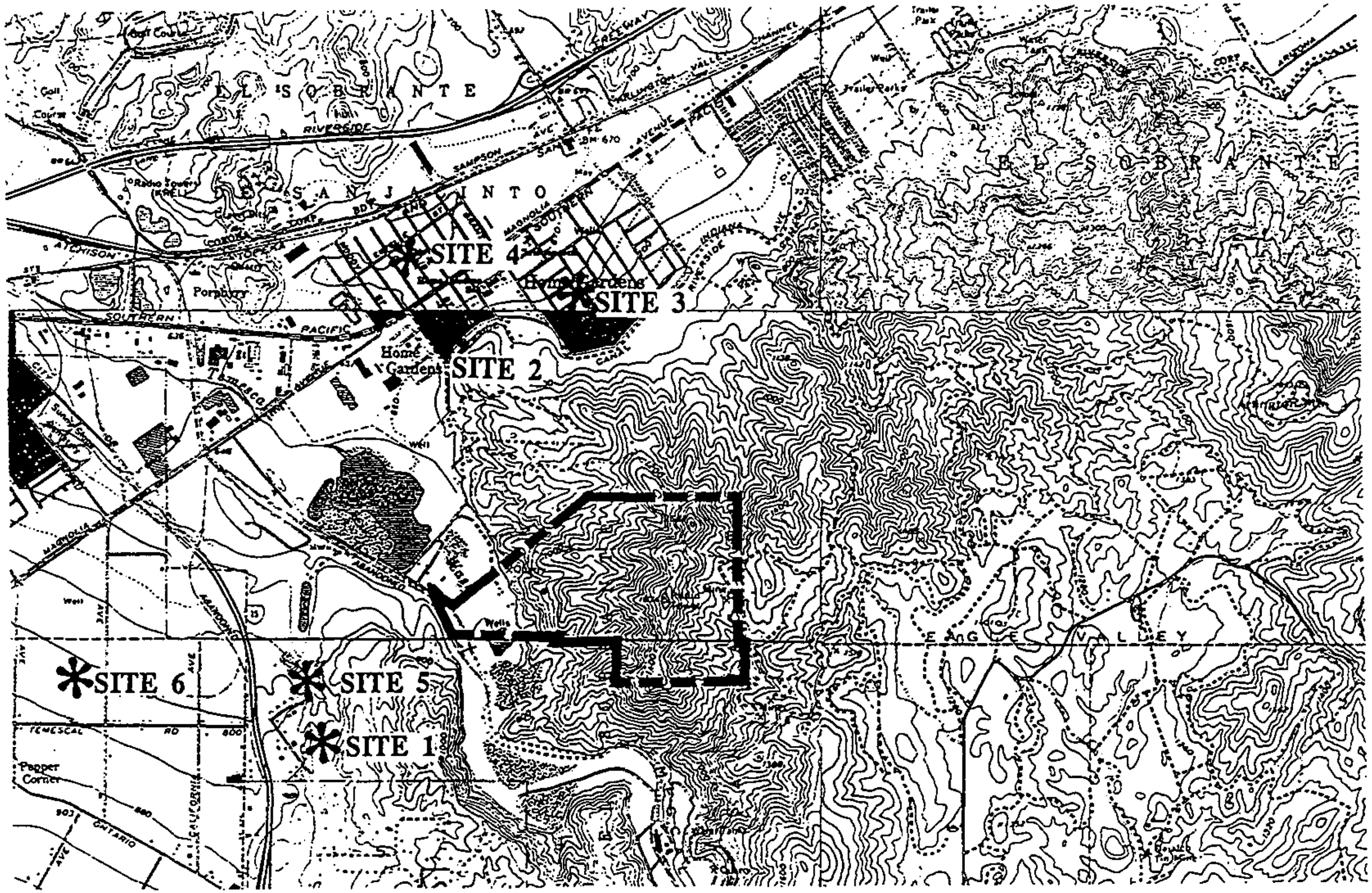

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Exhibit 4 - Site Plan & Noise Measurement Locations

TABLE 2
MONITORING TIMES AND LOCATIONS

SITE	DATE	DAY OF WEEK	TIME
Daytime			
1	12/2/88	Friday	11:45 AM to 12:00 PM
2	12/2/88	Friday	12:15 PM to 12:30 PM
3	12/2/88	Friday	12:45 PM to 1:00 PM
4	12/2/88	Friday	2:00 PM to 2:15 PM
5	12/4/88	Sunday	14:00 PM to 14:15 PM
6	12/4/88	Sunday	14:30 PM to 14:45 PM
Nighttime			
2	2/8/89	Thursday	1:30 AM to 1:45 PM
5	2/8/89	Thursday	12:30 AM to 12:45 PM
6	2/8/89	Thursday	1:00 AM to 1:15 PM

TABLE 3
AMBIENT NOISE LEVELS

MONITORING LOCATION (Site-Location)	LEQ (DB)	LMAX (DB)	LEVEL EXCEEDED FROM 1% TO 90% OF THE TIME (DB) L1	L5	L10	L33	L50	L90
Daytime								
1 - Belair	47	57	55	52	50	46	45	42
2 - Neece/Indiana	53	68	64	59	54	47	46	43
3 - Somerdale	50	67	64	57	52	43	42	39
4 - Estelle	61	80	72	68	64	54	50	44
5 - Old Temescal	42	50	48	45	44	42	41	38
6 - Rimpau	49	61	57	54	52	49	47	43
Nighttime								
2 - Neece/Indiana	43	52	49	46	46	44	43	40
5 - Old Temescal	44	55	54	50	46	43	42	41
6 - Rimpau	39	46	44	42	41	39	39	36

2.3.2 Existing Traffic Noise Levels

Existing noise levels in the vicinity of the project area are attributable to traffic and train noise sources and existing mining operations in the area.

2.3.2.1 Roadway Noise Levels The highway noise levels projected in this report were computed using the Highway Noise Model published by the Federal Highway Administration ("FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, December 1978). The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute the "equivalent noise level." A computer code has been written which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these noise levels and summing them results in the CNEL for the traffic projections used. CNEL contours are found by iterating over many distances until the distances to the 60, 65, and 70 CNEL contours are found.

Existing traffic volumes and estimated speeds were used with the FHWA Model to estimate existing noise levels in terms of CNEL. Traffic volumes were obtained from the traffic study for this project by Kunzman Associates, (November 8, 1988). The traffic data is presented in Table A-1 in the Appendix. The traffic mix and time distribution are presented in Tables A-2 in the Appendix. The data for the arterial roadways were developed by the Orange County Environmental Management Agency and are considered typical for arterial roadways in Southern California.

The distances to the CNEL contours for the roadways in the vicinity of the project site are given in Table 4. Note that the values given in Table 4 do not take into account the effect of any existing noise barriers or topography that may affect ambient noise levels.

TABLE 4
EXISTING TRAFFIC NOISE CONTOURS

ROADWAY	DISTANCE TO CONTOUR (FT) 60 CNEL	65 CNEL	70 CNEL
Magnolia Avenue			
- East of McKinely	159	74	34
- I-15 to Cajalco	129	60	28
- El Sobrante to Rimpau	151	70	32
Cajalco Street			
- South of Magnolia Avenue	19	9	4
I-15 Freeway			
- Magnolia to 6th Street	776	360	167
- Magnolia to Old Temescal Rd.	801	372	172

2.3.2.2 Railroad Noise Levels Data on railroad operations were obtained from the Atchinson, Topeka & Santa Fe Railroad (Jim Beard, 12/16/88) and are summarized in Appendix Table A-C. Track A is used located approximately 1000 feet north of Site 2 and is serviced by a Freight train, Amtrak and one "local" train. Track B is located approximately 1,200 feet west of Site 5. The results of the train noise projections are displayed in Table 4 in terms of noise levels at distances of 35, 50, 100, 200, 400, 800, and 1200 feet from the tracks. Note that the values given in Table 5 do not take into account the effects of any intervening barriers or topography. These effects are included in the mitigation section.

TABLE 5
RAILROAD NOISE LEVELS

DISTANCE FROM TRACK CENTERLINE (feet)	35	50	100	200	400	800	1200
TRACK A * TOTAL TRAIN CNEL (DB)	78.9	77.5	74.7	70.7	64.9	59.2	55.9
TRACK B ** TOTAL TRAIN CNEL (DB)	64.4	62.9	60.2	56.2	50.4	44.7	41.4

* Track A is used located approximately 1000 feet north of Site 2
** Track B is located approximately 1,200 feet west of Site 5

3.0 POTENTIAL NOISE IMPACTS

Noise impacts for the proposed project can be generated by mining operations such as blasting, drilling, earth moving, aggregate processing, asphalt plant, concrete batch plant, as well as an increase in traffic on the roadways in the vicinity of the project. Noise levels generated by on-site operations will bee assessed relative to the Riverside County Model Noise Ordinance. Truck traffic impacts are evaluated in terms of the CNEL scale.

3.1 Potential Noise Impacts Due to On-site Operations

The proposed mining operations on the site will potentially increase the noise levels in the surrounding areas. Sources of noise include:

(1) mining and earth moving
(2) rock crushing and aggregate sizing
(3) drilling
(4) blasting
(5) asphalt plant
(6) concrete batch plant

Each of these operations are discussed below. Note that all of these projections are for unshielded noise exposure. The effects of shielding are presented in specific receptor analysis.

3.1.1 Mining and Earth Moving

Noise measurements have previously been made for typical equipment used in similar mining and earth moving operations. The previous measurements are indicative of what may be expected for the proposed project. The earth moving equipment involved in the previous set of measurements included two D-8 Caterpillar Tractors, a Gallion Grader, and a Terex TS-14 Scraper. Additionally, haul trucks passed to and from the mining site. The measurements were made with a B & K Model 2230 Sound Level Meter, and calibrated before and after each measurement series. Measurements were made approximately 250 and 500 feet from the site, and a scraper and a dozer were in operation during the measurement period. The measurement results are presented in Table 6, and are in terms of the maximum noise level, the minimum noise level, and the equivalent noise level for the 15 minute measurement period.

Noise measurements of jaw crusher units have been made at other plants. The crusher noise levels are discussed more in the following section. Although measurement data for the exact type of crusher that will be used near the working face is not available, it is believed that the noise levels generated by the crusher unit will be of secondary importance in comparison to the heavy equipment that will be in operation.

TABLE 6
NOISE LEVELS FOR MINING AND EARTH MOVING OPERATIONS

Noise Metric	Noise Level (dBA) At Distance (Ft) 250	500
Maximum Level	72.1	66.3
Minimum Level	51.9	43.2
Equivalent Level	63.5	54.6

3.1.2 Rock Crushing and Aggregate Sizing

Typical operations will use two standard cone crushers, one short head crusher, belt conveyors, three 8' x 20' triple deck screens, one 980 front end loader, and haul trucks. Aggregate processing operations may be wet or dry. In dry aggregate processing sand and rock will be screened and the rock crushed. Then sand and rock will be separated and stacked. Both will be loaded into hoppers and moved by conveyors to the loading area where it is stacked or loaded onto trucks. In wet aggregate processing water is continuously added to the borrow material as it is placed on vibrating screens. The water is recovered by a dewatering system.

Noise measurements have previously been made for operations at a sand and gravel plant. The measurements were made approximately 160 feet from the operations. The measurement results are presented in Table 7, and are in terms of the maximum noise level and the equivalent noise level for the 15 minute measurement period. The loudest noise levels measured from this process were due to the truck engines. The crusher and other equipment were much quieter than the trucks.

TABLE 7
NOISE LEVELS FOR AGGREGATE PROCESSING OPERATIONS

Noise Metric	Noise Level (dBA) At 160 Ft
Maximum Level	87.0
Equivalent Level	73.0

3.1.3 Drilling

The exact type of drilling equipment that will be used will not be known until after the drilling is initiated at the site. Drilling rigs are rated by the size of the drilling bit. Most of the drilling rigs are air driven by a compressor. Some utilize a hydraulic drive. These operations will be located at the same areas where the mining operations are proposed. For the project, drilling operations could operating in the daytime or nighttime. Drilling operations are expected to remain relatively constant over the lifetime of the project.

Noise data on drilling rigs were obtained from actual field measurements. Noise measurements were made at the California State University at San Marcos. This site is located at the south end of the existing Twin Oaks Valley Road in the City of San Marcos. The noise measurements were conducted on June 7, 1988. The measurements were made with a Bruel and Kjaer Model 2230 Sound Level Meter with 1/2 inch precision microphone. The system was calibrated before and after the measurement series. The drilling operations were done by the Southern California Drilling and Blasting Company. Two drills were in operation during the measurement period. According to the foreman the larger drilling rig was a 6.5 inch rig with hydraulic drive. The other drilling rig was a 3.5 inch air drilling rig with a 600 cubic feet per minute air compressor. Both rigs were in full operation during the measurement period. The noise levels from the drilling operations will be relatively constant with few peaks; the maximum noise level was very close to the equivalent noise level. The data is presented in Table 8 in terms of the equivalent and maximum noise level at 100 feet from the rig.

TABLE 8
NOISE DATA ON DRILLING RIG OPERATIONS

Noise Metric	Noise Level (dBA) At 100 Ft
Equivalent Level	82.7
Maximum Sound Level	85.0

3.1.4 Blasting

Extraction of the rock material is normally performed using blasting. The large rock is then transported to the primary crushing operations. The blasting will occur as often as once per day for the final buildout of the project. Noise levels measured at similar operations were used as the basis of determining the noise levels generated by blasting. Measurements were made using a General Radio 1982 Sound Level Meter. The instrument was calibrated before and after the field test. The measurements were made approximately 1300 feet from the blast. The spectrum for the maximum measured noise level is presented in Table 9.

TABLE 9
NOISE SPECTRUM FOR BLASTING OPERATIONS

Frequency (Hz)	31	63	125	250	500	1000	2000	A-Level
Noise Level (dB) @ 1300 Ft	84	77	70	62	54	45	36	59

It can be seen from Table 9 that the blasting noise consists largely of low frequency noise components. The human ear is less sensitive to low frequency noises than it is to high frequency noises, and the A-weighted noise scale which has a frequency correction that correlates overall sound pressure levels with the frequency response of the human ear weights the noise levels accordingly. The resultant A-weighted maximum noise level is 59 dBA which is significantly less than the unweighted peak noise level of 84 dB at 31 Hz.

It should be noted that blasting noise is a relatively infrequent impulsive noise and its annoyance should be determined on the basis of the Noise Ordinance Lmax standard rather than the CNEL standard. Looking at blasting noise in terms of the CNEL metric does not clearly identify the impact from these operations.

3.1.5 Asphalt Plant

Sand and crushed rock will be moved by conveyor belts from the dry aggregate plant to the asphalt plant. In the asphalt plant these materials will be heated to dry. The dried aggregate will then mixed with tar and other materials to make asphalt. The final product is loaded onto trucks by conveyor belts. Noise measurements have previously been made for operations at an asphalt plant. Measurements were made approximately 200 feet from the site. The estimated noise levels generated by these operations are given in Table 10. The results are in terms of the maximum noise level, the minimum noise level, and the equivalent noise level.

TABLE 10
NOISE LEVELS FOR ASPHALT PLANT OPERATIONS

Noise Metric	Noise Level (dBA) At 200 Ft
Maximum Level	73.9
Minimum Level	56.7
Equivalent Level	66.7

3.1.6 Concrete Batch Plant

Washed aggregate is moved by conveyor belts to the concrete batch plant. In the concrete batch plant the aggregate is poured into the concrete machine where water and cement is added to make a finished product. The material can be directly loaded onto concrete mixing trucks. Noise measurements have previously been made for operations at a concrete batch plant. Measurements which include truck loading noise also include noise from the truck back-up horn. The measurements were made approximately 135 feet from the operations. The measurement results are presented in Table 11, and are in terms of the maximum noise level, the minimum noise level, and the equivalent noise level. The loudest noise levels measured from this process were due to the truck engines. The trucks used very high engine speeds while being loaded increasing the engine noise levels. The conveyors and other equipment were much quieter than the trucks.

TABLE 11
NOISE LEVELS FOR CONCRETE BATCH PLANT OPERATIONS

Noise Metric	Noise Level (dBA) At 135 Ft
Maximum Level	80.7
Minimum Level	64.0
Equivalent Level	74.5

In addition to the above concrete batch plant noise level data Table 12 indicates typical A-weighted noise levels for a distance 50 feet from the source for operations similar to those proposed for the Corona Quarry Surface mining Operation. This table also includes the octave band sound levels at this distance. Table 12 was obtained from a noise study by New Horizons Planning Consultants, Inc. ("Noise Report for Twin Oaks Quarry South Coast Asphalt Company, March 1982").

3.1.7 Combined Off-site Noise Impacts Due to On-site Operations

To assess the impact of the plant operations representative locations in the nearest proposed residential communities were chosen for analysis. The area of most concern is the residential area near Site #2 approximately 3,000 feet west of the project boundary (see Exhibit #5). Residences currently exist in this area adjacent to Site #5. Site #6 is also a receptor site located in an existing residential area 7,000 feet west of the project boundary. The other receptor site (Site #2) is located approximately 4,000 feet north of the project boundary and is shielded from the mining noise source due to the fact that the intervening topography breaks lin-of-site from noise source to receptor.

The noise level at these receptors due to each of the on-site operations described above was calculated by the extrapolation/interpolation of the measured results. Assumptions in the projections include hard site conditions (no ground absorption) and spherical divergence for the major operations, resulting in a 6 dBA drop-off rate per doubling of the distance. Noise levels also include the effect of atmospheric absorbtion (1dB noise reduction per 1000 feet).

The results are presented in Table 13. The noise levels calculated are the peak noise level (Lmax) and the equivalent noise level (Leq). A worst case and typical case analysis is presented. According to the mining plan the site will be mined in such a way that the intervening topography will break line-of site from the mining operations to the receptor (Site #2) to the north. This receptor will therefore be shielded from the mining noise. This shielding effect translates to atleast 5 dB of noise attenuation at this Site. Some homes adjacent and to the north of Site #5 will have line-of-sight to the mining noise source. However, line-of site from receptor to mining noise source will be broken by intervening topography for most residences in the vicinity of Site #5. Therefore most homes will experience a shielding effect of at least 5 dB. All mining equipment will be located behind some form of a barrier or down inside a mining pits such that line-of-sight to the homes west of the project will be broken. Therefore the homes west of the project will experience a noise reduction of at least 5 dB due to this shielding of equipment noise. For example, in the initial phases of operations grading equipment and potentially blasting operations will occur on top or near the top of the existing hill. The shielded noise levels shown in Table 13 will therefore be the most appropriate levels predicted for the receptor sites. Unshielded levels are indicated to show the effect of shielding on the noise levels at the three receptor sites (Site #2, Site #5 and Site #6, see Exhibit.5).

Plant Equipment Noise Levels

Activity	31	63	125	250	500	1000	2000	4000	A-Level	Distance(feet)
	Octave Band Sound Level (Hz)									
988 Front Loader Dumping (Rock into 769B)	76	70	81	74	75	79	72	63	81	50
Jaw Crusher Operation	86	86	84	83	81	76	72	65	82	50
Jaw Crusher Idling	71	75	71	71	73	69	66	60	74	50
3 Screen Classifying and Crushing Operation	81	81	81	81	80	84	81	79	88	50
Asphalt Plant Operation	83	85	82	85	84	78	74	74	85	50
Rock Drilling	91	89	91	94	89	81	90	78	93	50
Batch Plant*	74	76	75	74	74	71	67	63	76	125
Conveyor and Rock Dropping	63	62	63	59	58	57	56	54	62	50
Blasting**	84	77	70	62	54	45	36	-	59	1300

* Based on the average of measurements reported in Conrock Mission Valley Plant Noise Survey, San Diego Acoustics, April 16, 1979.

** Spectrum based upon a measurement in 31.5 Hz octave band, an A-level of 59 and a typical shape.

Table 12 - Typical Noise Levels for an Extraction Facility

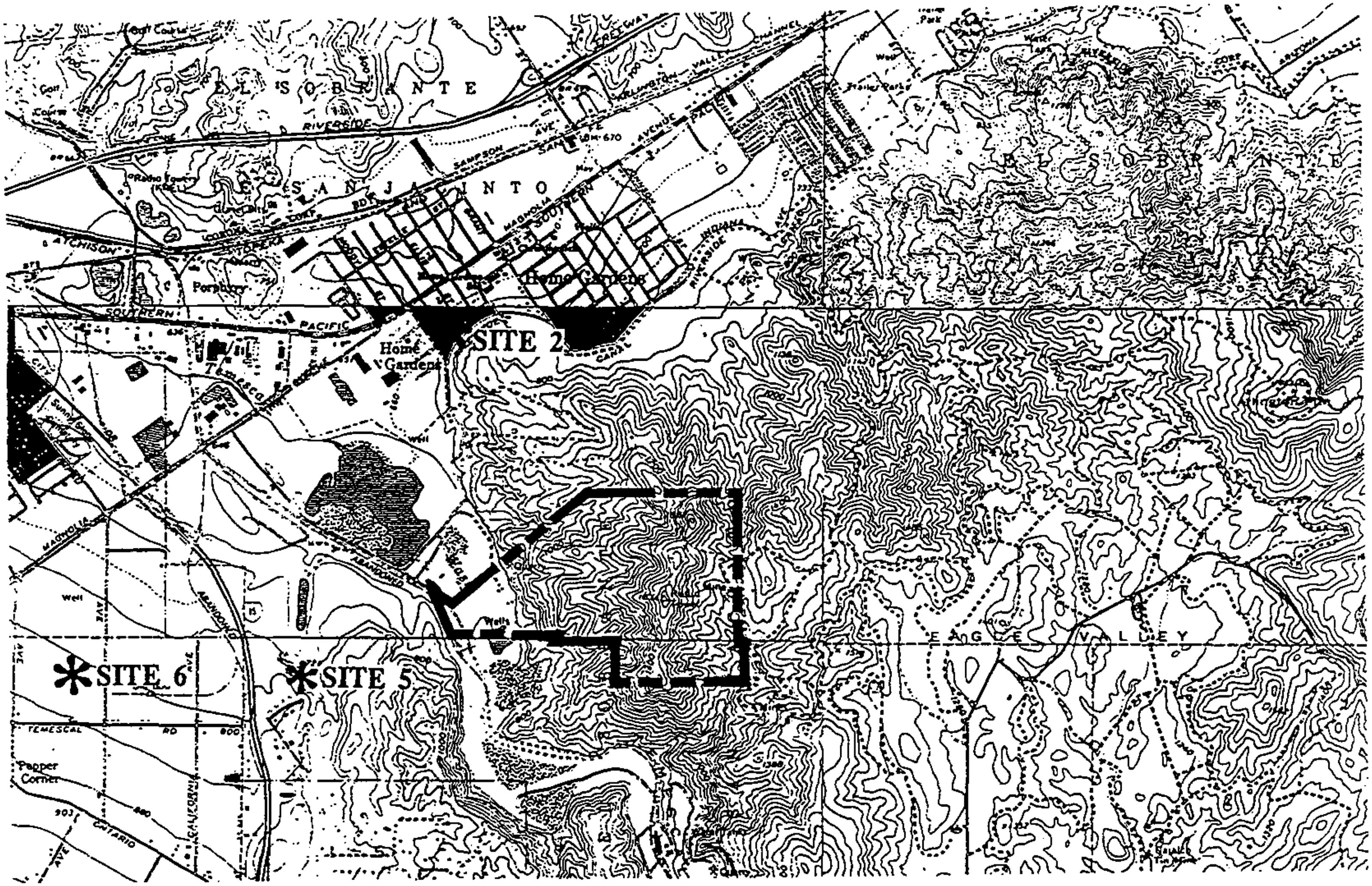

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Exhibit 5 - Representative Receptor Locations

TABLE 13
COMBINED PLANT NOISE LEVELS AT THE NEAREST PROPOSED RESIDENCES

Operation	Unshielded Lmax	Unshielded Leq	Sheilded Lmax	Sheilded Leq
SITE #2				
Mining & Earth Moving	*	*	36	28
Rock Crushing & Aggregate Sizing	*	*	47	33
Drilling	*	*	-	39
Blasting	*	*	42	-
Asphalt Plant	*	*	36	29
Concrete Batch Plant	*	*	39	33
			Max = 47	Total = 41
SITE #5				
Mining & Earth Moving	42	33	37	28
Rock Crushing & Aggregate Sizing	53	39	48	34
Drilling	-	44	-	39
Blasting	43	-	43	-
Asphalt Plant	42	35	37	30
Concrete Batch Plant	45	39	40	34
	Max = 53	Total = 47	Max = 48	Total = 42
SITE #6				
Mining & Earth Moving	32	24	27	19
Rock Crushing & Aggregate Sizing	43	29	38	24
Drilling	-	35	-	30
Blasting	38	-	38	-
Asphalt Plant	32	25	27	20
Concrete Batch Plant	36	29	31	24
	Max = 37	Total = 32	Max = 38	Total = 32

* Indicates that this site will always be shielded from the mining noise.

The noise levels reveal that the nearest residential land uses will not be adversely impacted by the noise generated by the proposed mining operations during typical conditions. These projected sound levels are similar to the levels measured from current operations from adjacent quarries. During typical operations the noise from the mining operations will not be audible or will be barely audible in residential areas. The mining operations will be in compliance with the example Model Noise Ordinance.

Non-typical conditions may include low ambient noise levels or unusual meteorlogical conditions such as an existing inversion layer. During these non-typical conditions the noise from mining operations will more likely be audible at receptor sites but will still comply with the sample Model Noise Ordinance. The blasting noise, being of lower frequency will have a minimal benefit from shielding. The blasting noise will occasionally be audible, but these levels will be below the Model Noise Ordinance levels.

Residential areas will experience lower ambient noise during the nighttime. Therefore the sound from the quarry operations are more likely to be audible. The early morning operations such as truck loading may commence as early as 6 a.m.. Night-time noise will also include noise from processing, drilling and maintenance operations. The sample model noise ordiance is 5 dB more restrictive during the nighttime hours. Although nighttime noise will more likely be audible, these noise levels will still comply with the sample Model Noise Ordinance.

3.2 Off-Site Noise Impacts Due to Vibration

Potential impacts due to quarry blasting may include structural vibration in some of the homes surrounding the quarry site. In order to assess the degree of impact due to vibration it is necessary to first estimate the amount of structural vibration due to the blasts and then to determine the potential health significance of these vibrations.

3.2.1 Background

Vibration is measured in terms of acceleration. The two most common terms of scaling acceleration are in terms of meters per second squared or in multiples of the acceleration of gravity, commonly referred to as "g's." Exhibit 6 presents a rough indication of the level of vibration that can be expected for several types of activities. The exhibit is divided into three categories; (1) hand-arm, (2) whole body, (3) building.

When an element is excited it will vibrate at its own natural frequency. Similar to a string on a guitar; no matter how fast or how hard you pluck the string it will still vibrate at the same frequency or note. How hard you pluck the string will affect the amplitude or the loudness of the note. You have to change the physical properties of the guitar string, such the length, tension, or weight, to change the natural frequency of the string. Different building elements will have different natural frequencies. Similarly, the different elements that make up the human body have different natural frequencies. The natural frequency varies from person to person and varies depending if you are standing, siting, etc. Typical natural frequencies for both building elements and body elements are presented in Exhibit 7.

Stephens et. al. ("Guide to the Evaluation of Human Exposure to Noise From Large Wind Turbines," NASA Technical Memorandum 83288, March 1982) have compiled data for helicopters, aircraft, and wind turbines which show a correlation between wall, window, and floor vibration for various noise levels. These relationships are reproduced in Exhibit 8. To obtain acceleration levels of 0.001g in floors, walls, and windows, peak noise levels of approximately 95, 80, and 75 dB respectively are required.

Stephens et. al. have also identified the noise levels as a function of frequency that will produce perceptible building vibration. The curves developed for windows, walls, and floors are provided in as Exhibit 9. If noise levels exceed these curves then vibrations that are large enough to be perceived by humans may be evident. The curves are a general guide to the potential generation of perceptible vibrations.

Humans can perceive vibrations through two mechanisms; tactile and whole body. Tactile perception is the sense of touch. Whole body vibrations are experienced when the body as a whole is subjected to vibration, such as a person standing on a vibrating floor. The level at which tactile and whole body vibrations become perceptible differ. The levels of vibration that is perceptible to humans for both tactile and whole body vibrations are presented in also presented in Exhibit 10. Below 1 Hz less vibrations is necessary to perceive whole body vibrations. Since most building elements have natural frequencies greater than 1 Hz, most vibrations will be perceived first through the sense of touch.

3.2.2 Structural Vibration Due To Blasting

	Hand-Arm	Whole Body	Building
10g			
	Operation of a Jack Hammer	Riding Motorcycle	Building During Demolition
1.0g			
	Operation of a Chain Saw	Riding in Fork Lift or other Construction Equipment	Home Near Blasting Site
0.1g			
	Operating Controls for Heavy Equipment	Riding in Automobile or High Speed Train	Home Near Pile Driver
0.01g			
	Holding Smoking Pipe	Riding in Airplane or Ocean Liner	Home Near Railroad Line
0.001g			
	Resting Hand on Cushioned Armrest	Riding in Space Capsule in Orbit	Home in Quiet Rural Area
0.0001g			

Exhibit 6

Examples of Vibration Levels

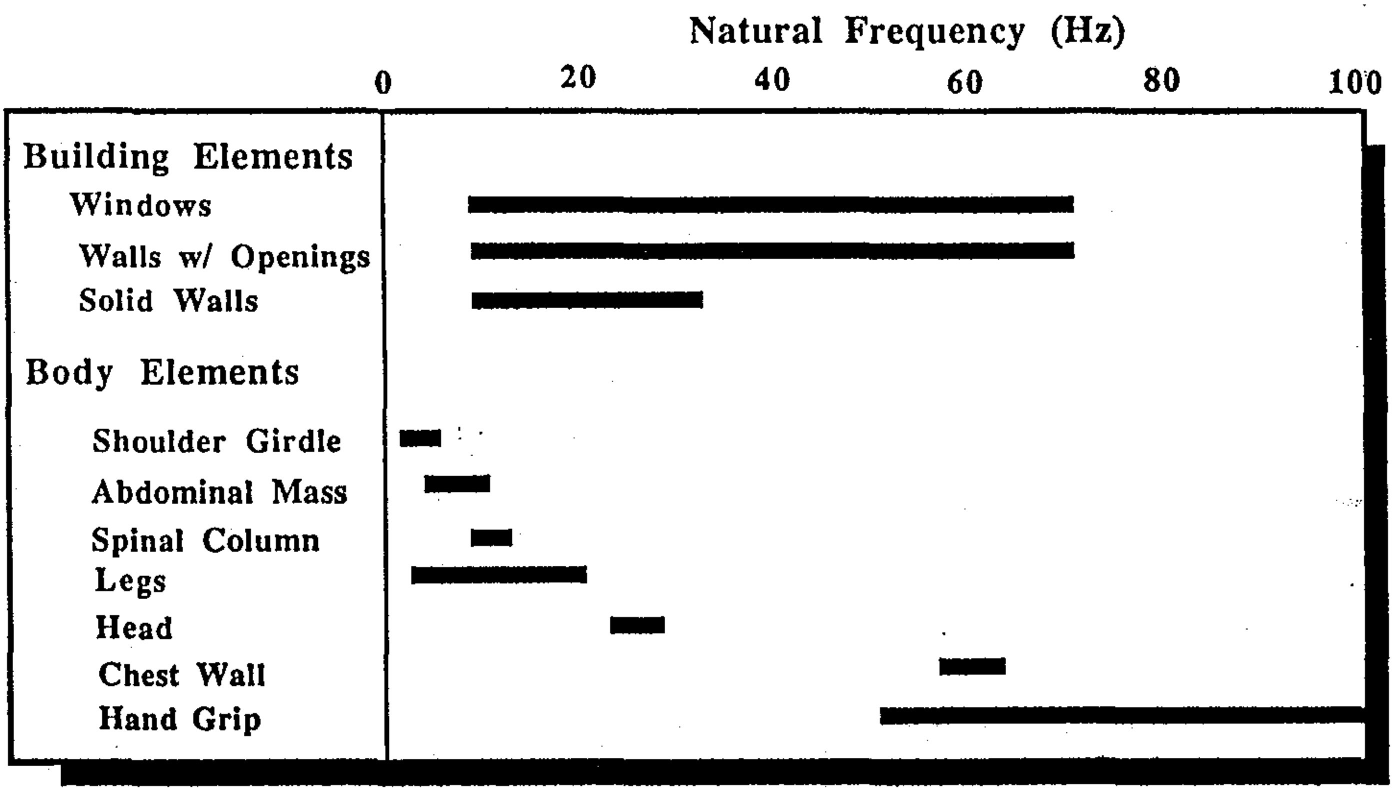

Exhibit 7 - Examples of Natural Frequencies for Various Elements

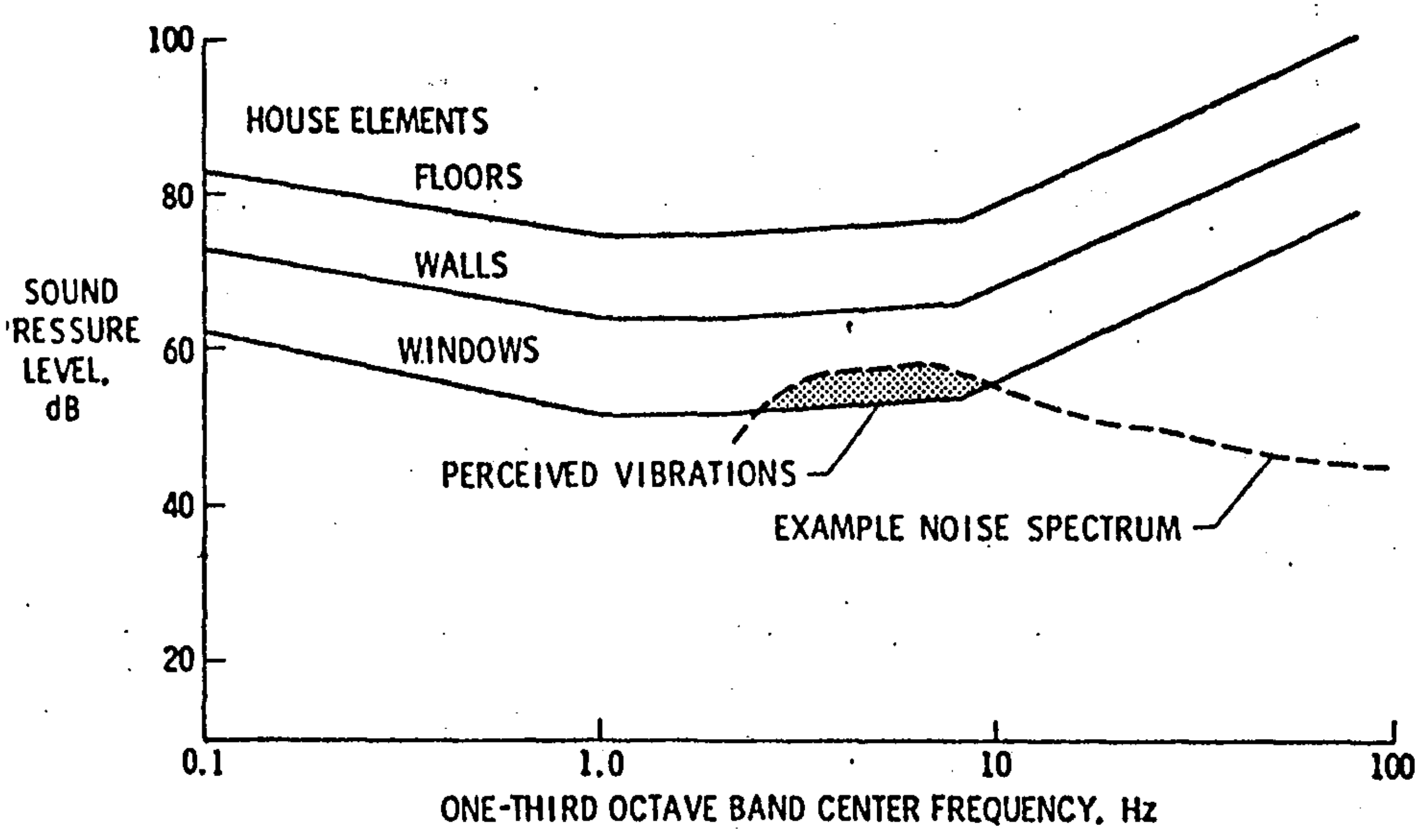

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Exhibit 8 - Sound Levels Sufficient to Cause Perceptible Vibrations

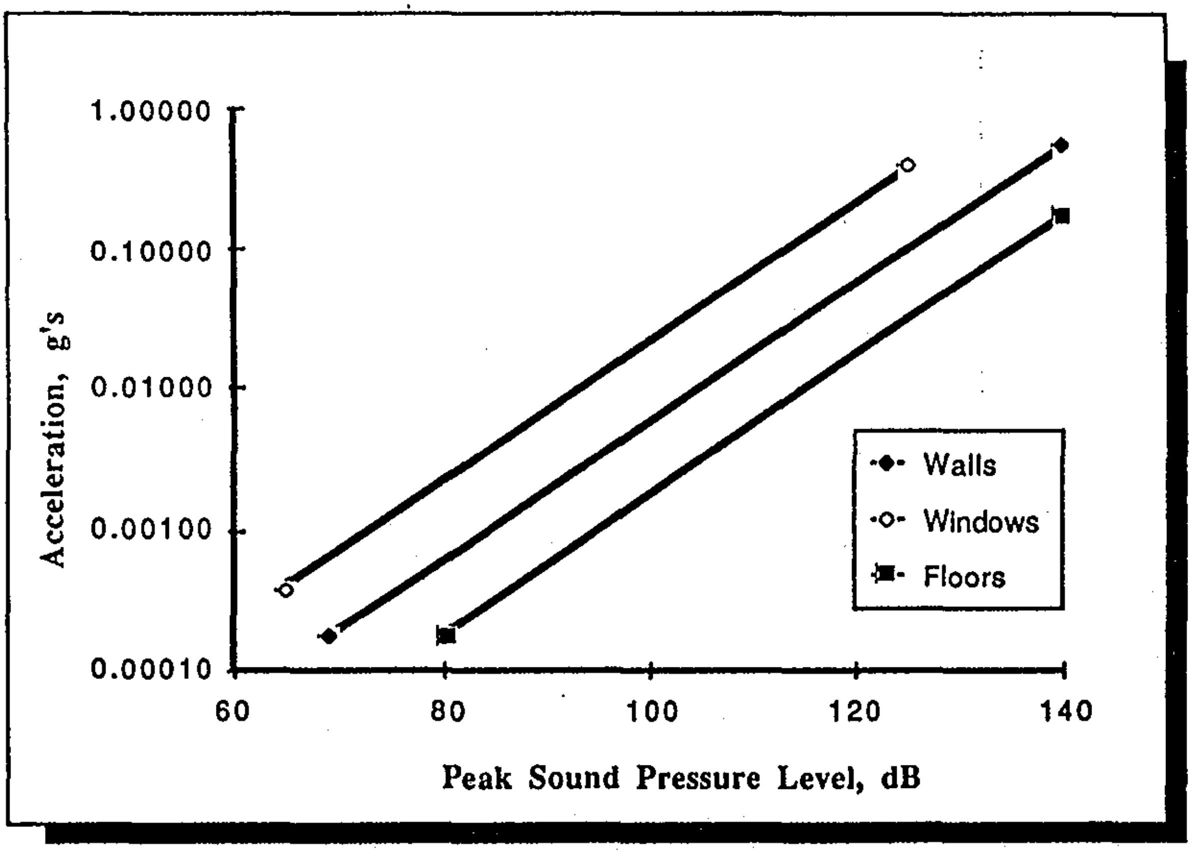

Exhibit 9 - Acceleration Generated by Sound Sound Pressure Levels

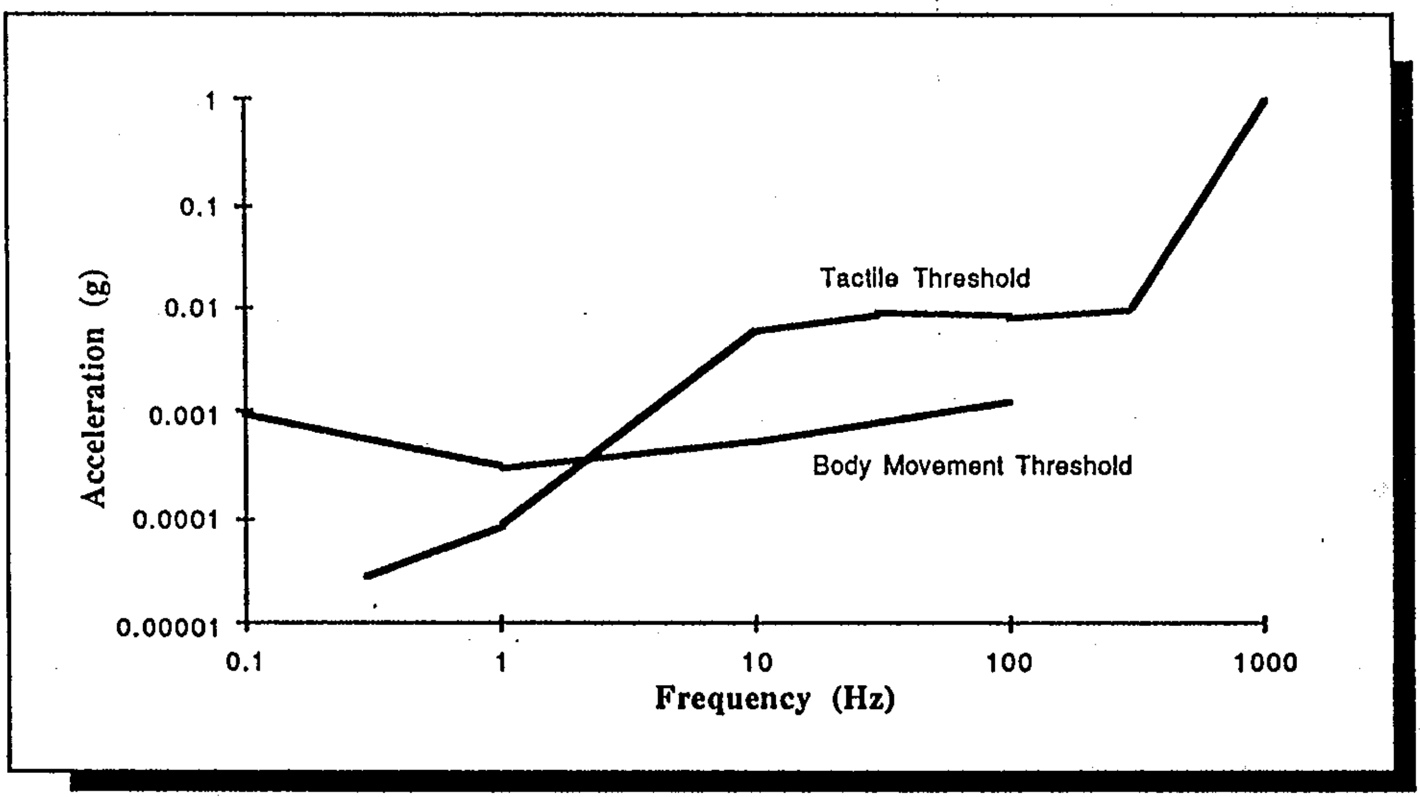

Exhibit 10 - Perceptible Levels of Vibration

The release of energy from a blast of the type anticipated for the CalMat, Corona Quarry results in three effects that can be potentially recognized at locations distant from the blast site. These effects are in the form of vibrations within the earth (Ground Vibrations), noise (Air Blast), and dust. Earth vibration and the Air Blast noise influence structural vibration. A report prepared by Don Harris & Associates ("Draft Report, CalMat Company, Corona Quarry, September 23, 1988) presented information on the blasting plan for the Corona Quarry. Details of that discussion are presented below.

When a blast is detonated most of the energy produced travels through the rock, soil, etc. in the form of shock pressure waves and subsequent gas pressure. These cause individual particles to oscillate in random directions. If these vibrations are of sufficient intensity, they may cause structural damage. However as they move through the earth and expend energy, they become weaker as a direct function of distance. The further away, the lower the vibration intensity.

Numerous studies have determined that both the frequency (cycles per second) of the vibrating waves and the Peak (maximum) Particle Velocity are contributing factors in blast related damage. However, in this geologic environment and the blasting techniques anticipated, Peak Particle Velocity is considered to be the most critical and appropriate descriptor.

For many years a value of 2 inches per second (Peak Particle Velocity) has been assumed as a threshold for extremely minor damage to wood frame construction (houses) under the conditions mentioned above. However, a more conservative value of 1 inch per second has, in recent years, become more widely accepted and would be appropriate for the situation in this case. Since these values represent actual ground motion, they are not to be confused with the swaying of a building, for example, which may be very noticeable to occupants but not damaging to the structure itself.

Frequently, a number referred to as Scaled Distance is used to place limitations on blasting operations in lieu of actual vibrations monitoring, or to help design blasts in advance. Since it has been determined that ground vibrations are a function of the distance from the blast to some location and the quantity of explosives detonated at any individual time, these two factors can be placed into a mathematical equation to determine safe limitations. It should be understood, that if explosive charges are detonated at intervals of 8/1000th of a second (8 ms) or more apart, they will not amplify one another. Therefore the critical factor is not the total quantity of explosives consumed in a "shot", but rather the quantity detonated at one instant. To the human ear a "shot" may sound as if everything was detonated simultaneously, whereas there may, in fact, have been several small blasts 8 milliseconds or more apart. Scaled Distance therefore considers the distance from the blast and the maximum quantity of explosives detonated within any 8 millisecond period.

$$\text{Scaled Distance} = \text{Distance (ft)}/(W^{1/2})$$

Note: "W" is in pounds/8 millisecond and "Distance" is the distance from the blast to the receptor.

Assuming a very conservative (U.S. Bureau of Mines) Scaled Distance number of 60 and a minimum distance of 2640 feet would result in a limitation of approximately 2000 pounds of explosives per 8 ms increment. Seismic monitoring at the commencement of operations would increase the above limitation considerably if it should prove to be advantageous from an operating standpoint.

The second effect from blasting operations, mentioned at the beginning of this section is noise or Air Blast. Air Blast is a compressive wave that travels through the atmosphere. If this wave is audible it is called noise while Air Blast at frequencies below 20 Hz (inaudible to the human ear) is called concussion. This wave creates a pressure in the air greater than normal atmospheric pressure and can be measured as an "overpressure" and expressed as pounds per inch (psi). The pressure can be converted to decibels (dB), which is a more common expression for sound, since it approximates the response of the human ear.

Air Blast from an explosive shot can be produced by several mechanisms. Primarily it is the result of energy which has not be confined at the site and is allowed to escape into the atmosphere. In order to achieve satisfactory fragmentation in an operation such as the blasting proposed for the Corona Quarry, it is impossible to prevent some energy release. Therefore, there will always be some noise associated with the blasting.

Once a sound wave from a blast enters the atmosphere it is virtually uncontrollable. However there are certain natural conditions that may determine its direction and local intensity. Temperature inversions in the atmosphere will cause the wave to be refracted or bent away from its natural course. Reflection will occur off surfaces such as the pit walls. Wind will distort the wave pattern and warp it downwind or possibly back towards the earth. These factors are beyond the blasters control but should be recognized and avoided, if possible. It has been demonstrated that at times several of the above circumstances are present at one time. The wall reflected, inversion bent, wind carried wave might produce a focal point at a considerable distance from the blast site. The overpressure at this location may be many times greater than at a closer distance.

Since window panes are typically the weakest part of the structure subjected to Air Blast, they are most likely to be the first indication of this effect. The principal effects are (1) the rattling of windows and (2) noise that startles people. Occasionally the Ground Vibrations and the Air Blast appear at a location approximately the same time, thereby magnifying the apparent intensity. Individuals assume that since there windows rattled and they heard a blast, their house must have been violently shaken and damaged. Even without this assumption, they may have been startled awakened or in other ways disturbed. Complaints may then result due to this subjective response. The disturbance may be simply annoying or can be intollerable.

Information on blasting effects of typical surface mining operations was obtained from a study by Wiss, Jannery, Elstner and Associates, Inc., ("Control of Vibration and Blast Noise from Surface Coal Mining. Volume 1", December 1978). This study provided data on blasting effects from four different mines. This data was then used to determine typical levels for frequency of ground vibration and acceleration (g's) for these four cases of blasting. The calculated typical values for acceleration based on total weight of explosive per blast. The results of this study indicate that each blast will generate a seismic wave with a frequency which is less than that for most building elements. With the proposed 60,000 lbs of explosives to be detonated per shot (2,000 lbs per 8 millisecond blast increment and a maximum of 30 blast holes) the resulting acceleration was estimated to be less than .005 g's at the nearest home. This vibration level is not considered significant for a once per day type of event. This amount is less than would be noticeable to the body. An individual may notice some small tactile vibration if touching a structure. Older structures may occasionally experience small levels of window rattling.

3.3 Potential Off-Site Traffic Noise Impacts

The proposed project will generate traffic, and as a result may alter noise levels in surrounding areas. To assess the impact of the project on land uses adjacent to streets that will serve the project, the increases in roadway noise along these streets were determined. These roadways were modeled for two future traffic conditions with project generated traffic. Traffic data used for noise projections were taken from the traffic study for this project by Kunzman Associates (November 8, 1988). The traffic data is presented in Table A-3 in the Appendix. Traffic speeds, time distributions and traffic mix for non-project traffic was assumed to remain the same as that used for existing conditions (Tables A-1 and A-2 in the Appendix). For project generated traffic the distribution and traffic mix is given in Table A-4 in the Appendix. The increase in traffic noise level due to the project is shown below in Table 14.

TABLE 14
INCREASE IN CNEL NOISE LEVELS FOR NEARBY ROADWAYS

ROADWAY	INCREASE IN CNEL DUE TO PROJECT (DB)
Magnolia Avenue	
- East of McKinely	0.4
- I-15 to Cajalco	6.9
- El Sobrante to Rimpau	0.7
Cajalco Street	
- South of Magnolia Avenue	17.7
I-15 Freeway	
- Magnolia to 6th Street	1.1
- Magnolia to Old Temescal Rd.	0.4

The data indicates that the CNEL noise levels will increase more than 3 dB due to the project for two of the roadway segments. There will be considerable increases in noise levels on these roadway links due to the increased truck traffic generated by the project. Table 14 indicates that noise levels in areas along Cajalco Street (Magnolia to the project) and along Magnolia Avenue (I-15 to Cajalco Street) will experience an increase in noise greater than 3 dB. However, there are no residential land uses along these commercial roadways. All other roadways experience increase in noise levels less than 1 dB. Truck traffic from the project do not impact residential land uses.

(In community noise assessment changes in noise levels greater than 3 dB are often identified as significant, while changes less than 1 dB will not be discernible to local residents. In the range of 1 to 3 dB residents who are very sensitive to noise may perceive a slight change. No scientific evidence is available to support the use of 3 dB as the significance threshold. In laboratory testing situations humans are able to detect noise level changes of slightly less than 1 dB. However, in a community noise situation the noise exposure is over a long time period, and changes in noise levels occur over years, rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB appears to be appropriate for most people.)

The FHWA Highway Traffic Noise Model was used along with the traffic volumes in Appendix Tables A-1 and A-3 (and traffic mix Tables A-2 and A-4 respectively) to project

"Project plus Existing" unmitigated noise levels. The modeling results are reported in Table 15 in the form of distances to the 60, 65, and 70 CNEL contours. These projections do not take into account any existing buildings/barriers or topography that may reduce noise levels.

TABLE 15
EXISTING PLUS PROJECT CONTOURS

ROADWAY	DISTANCE TO CONTOUR (FT) 60 CNEL	65 CNEL	70 CNEL
Magnolia Avenue			
- East of McKinely	169	78	36
- I-15 to Cajalco	292	136	63
- El Sobrante to Rimpau	372	172	80
Cajalco Street			
- South of Magnolia Avenue	167	77	36
I-15 Freeway			
- Magnolia to 6th Street	917	426	198
- Magnolia to Old Temescal Rd.	857	398	185

The results show that areas along Cajalco Street (Magnolia to the project) and along Magnolia Avenue (I-15 to Cajalco Street) will experience an increase in noise greater than 3 dB. Table 14 indicates that the increase in noise levels at these areas will result in an (Existing plus Project) noise level of less than 75 dBA. These areas are zoned for Commercial Industrial uses and will not contain any residential units. Exhibit 3 indicates that these areas are therefore classified as "Normally Acceptable" with the noise levels due to existing and project noise sources. All homes which are located along other roadways used for accessing the project will not experience a significant increase in noise due to the project.

3.0 MITIGATION MEASURES

Intrusive noise levels may result from Sand and Gravel Plant site operations when located close to residential developments. Mitigation measures to be considered include: (1) measures to quiet to the earth moving equipment, (2) reduction in number and size of equipment, (3) construction of berms around the project site, (4) performance conditions, and (5) construction of barriers along impacted roadways. Potential measures that are available fro this project are discussed in the following paragraphs.

It should be noted that the exact types of machinery, operational procedures, and in some cases, locations of equipment used will vary and are not known at this time. The precise noise levels generated by the Sand and Gravel Facility may be slightly different from those projected in this report. The numbers in this report should be considered a "best estimate."

1. A performance condition may be imposed on the mining site operations. A performance condition would allow the site operations to proceed as long as specified noise levels (i.e., the Model Noise Ordinance or equivalent) are not exceeded. The noise limits contained in noise ordinances are designed to protect quiet residential areas from excessive noise. The analysis shows that the project would comply with typical noise ordinance levels. A noise ordinance would allow mining operations to proceed, and provide protection from excessive noise levels. If problems arise, equipment or operations could be modified in such a way that would result acceptable noise levels in the adjacent residential areas. No mitigation measures are required to meet the model noise standards. However, the following measures are presented for consideration by the operator, and are discussed in the following paragraphs Possible measures that could be implemented at that time to further reduce the noise levels are listed below.

    - Noise generated by earth moving equipment comes from a variety of sources including exhaust noise, mechanical or engine noise, and contact with the ground. The most significant of these sources is usually the exhaust system. Several grades of mufflers are available for earth moving equipment. The mufflers are commonly ranked as stock, residential, or hospital; with hospital mufflers resulting in the most quieting. Manufacturers representatives were contacted to determine the amount of quieting that could be expected by upgrading the muffler systems on the earth moving equipment. Estimates of performance improvement were in the range of 5 to 10 dB. Tuning the engines may also lower the noise levels generated.

    - Reducing the number and size of the equipment can result in lower noise levels. Generally, the smaller the equipment the less noise generated. A smaller dozer, for example, may be employed to reduce noise. Since in this case, the dirt would be moved at a slower rate, the time the operations would be near the residences would be longer. However, this type of change would result in lower noise levels.

    - Installing acoustic blankets around drilling operations could be used to reduce the potential drilling noise. These acoustic blankets could reduce the drilling noise by 3 to 5 dBA. This is recommend for this project. Drilling operations from nearby existing quarries generate audible sound levels.

    - Temporary or permanent noise barriers have been employed around mining site and equipment. The barriers may be walls, berms made of processing material.

The local topography will determine the effectiveness of any noise barriers. CalMat proposes to locate all equipment such topography or mineral piles will be located between the noise source and the nearby homes. This will act as a noise barrier to shield these homes from direct exposure from the mining operations. This will reduce the potential noise levels by 5 dBA or more.

2. The general guidelines presented in the Don Harris report to minimize the effects of blasting should be implemented. In addition, initial blasting should be limited to 2000 pounds of explosive per 8 ms blast increment. Seismic monitoring at the start of the operations should be completed to determine the actual vibration levels from these blasts. The appropriate amount of explosives that limits potential impacts can be determined from these measurements. Avoid blasting during meteorological conditions (inversions) that result in higher blast levels.

APPENDIX

TABLE A
EXISTING TRAFFIC VOLUMES AND SPEEDS

ROADWAY	ADT	SPEED (mph)
Magnolia Avenue		
- East of McKinely	15,400	40
- I-15 to Cajalco	11,200	40
- El Sobrante to Rimpau	14,200	40
Cajalco Street		
- South of Magnolia Avenue	900	35
I-15 Freeway		
- Magnolia to 6th Street	41,500	55
- Magnolia to Old Temescal Rd.	43,500	55

TABLE B
TRAFFIC DISTRIBUTION IN PERCENT OF ADT

TYPE OF VEHICLE	DAY	EVENING	NIGHT
Automobile	75.51	12.57	9.34
Medium Truck	1.56	0.09	0.19
Heavy Truck	0.64	0.02	0.08

TABLE C
PROJECT TRAFFIC VOLUMES AND SPEEDS

ROADWAY	ADT	SPEED (mph)
Magnolia Avenue		
- East of McKinely	53	40
- I-15 to Cajalco	1,677	40
- El Sobrante to Rimpau	88	40
Cajalco Street		
- South of Magnolia Avenue	1,765	35
I-15 Freeway		
- Magnolia to 6th Street	1,147	55
- Magnolia to Old Temescal Rd.	441	55

TABLE D
PROJECT TRAFFIC DISTRIBUTION IN PERCENT OF ADT

TYPE OF VEHICLE	DAY	EVENING	NIGHT
Automobile	1.09	.17	2.10
Medium Truck	0.00	0.00	0.00
Heavy Truck	76.80	11.80	9.90

Table A-C
TRAIN OPERATIONS DATA

TYPE OF TRAIN	NUMBER OF OPERATIONS DAY	EVENING	NIGHT	NUMBER OF CARS PER TRAIN	TRAIN SPEED
TRACK A *					
Amtrak	2	0	0	6	60
Freight	12	3	9	54	55
Local	2	0	0	17	55
TRACK B **					
Freight	1	1	0	54	55

* Track A is used located approximately 1000 feet north of Site 2
** Track B is located approximately 1,200 feet west of Site 5

Appendix
5.7

Air Quality Report

AIR QUALITY ASSESSMENT FOR THE CORONA QUARRY SURFACE MINING OPERATIONS

COUNTY OF RIVERSIDE

Report # 12-20-2.b
February 9, 1989

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AIR QUALITY ANALYSIS FOR THE CORONA QUARRY
SURFACE MINING OPERATIONS

COUNTY OF RIVERSIDE

1.0 EXISTING AIR QUALITY

1.1 Climate

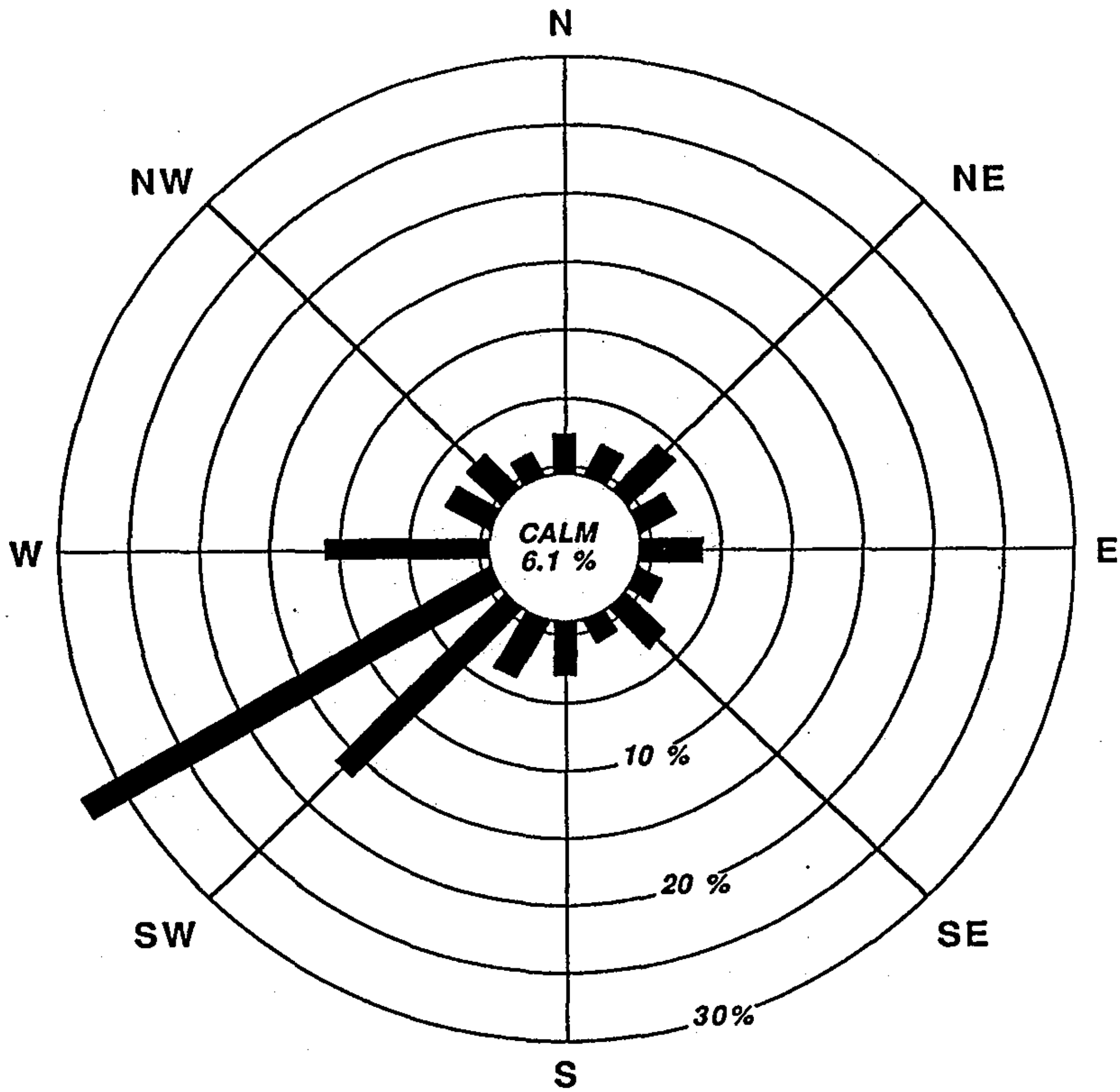
The climate around the Corona Quarry area, as with all of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. It maintains moderate temperatures and comfortable humidities, and limits precipitation to a few storms during the winter "wet" season. Temperatures are normally mild with rare extremes above 100 degrees F or below freezing. Daily and seasonal variations about the annual mean temperature of 62 degrees F are small.

Winds in the project area are almost always driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by daytime on-shore sea breezes. At night the wind generally slows and reverses direction traveling towards the sea. To illustrate the wind patterns, a wind rose for Riverside/San Bernardino area is presented as Exhibit 1. Wind direction will be altered by local canyons, with wind tending to flow parallel to the canyons. During the transition period from one wind pattern to the other, the dominant wind direction rotates into the south and causes a minor wind direction maximum from the south. The frequency of calm winds (less than 2 miles per hour) is less than 10 percent. Therefore, there is little stagnation in the project vicinity, especially during busy daytime hours. In summary, the prevailing wind provides a favorable situation for the proposed project. Dust generated on-site will usually travel away from existing residential areas which lie to the west of the project.

Southern California frequently has temperature inversions which inhibit the dispersion of pollutants. Inversions may be either ground based or elevated. Ground based inversions, sometimes referred to as radiation inversions, are most severe during clear cold early winter mornings. Under conditions of a ground based inversion, very little mixing or turbulence occurs, and high concentrations of primary pollutants may occur local to major roadways. Elevated inversions can be generated by a variety of meteorological phenomena. Elevated inversions act as a lid or upper boundary and restrict vertical mixing. Below the elevated inversion dispersion is not restricted. Mixing heights for elevated inversions are lower in the summer and more persistent. This low summer inversion puts a lid over the South Coast Air Basin is responsible for the high levels of ozone observed during summer months in the air basin.

1.2 Air Quality Management

The proposed project is located in the South Coast Air Basin and, jurisdictionally, is the responsibility of the South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (CARB). The SCAQMD sets and enforces regulations for stationary sources in the basin. The CARB is charged with controlling motor vehicle emissions.



Ontario International Airport

Exhibit 1
Wind Data

The SCAQMD in coordination with the Southern California Association of Governments (SCAG) has developed an Air Quality Management Plan (AQMP) for the air basin. The South Coast Air Basin has been designated a non-attainment area for ozone, carbon monoxide, nitrogen dioxide, suspended particulates under 10 microns, and lead. The AQMP has the goal of achieving healthful levels of air quality by 1987, and is mandated by State and Federal laws. Included in the plan are new stationary and mobile source controls; car pooling, vanpooling, and other ride-sharing programs; and energy conservation measures. The AQMP is designed to accommodate a moderate amount of new development and growth throughout the basin. The AQMP projections and mitigations are based on the SCAG-82 Growth Forecasts.

The operation of the proposed sand and gravel operation will be subject to the Rules and Regulations of the South Coast Air Quality Management District (SCAQMD). The Rules and Regulations were reviewed to identify provisions which would substantially effect the operation of the facilities. These Rules and Regulations that apply to this project include: Rule 401 Visible Emissions, that limits visible emissions; Rule 402 Nuisance, which provides for nuisance control of emissions; Rule 403 Fugitive Dust, that controls fugitive dust generation; Rule 405 Solid Particulate Matter, that places discharge limits on particulate matter; Regulation IX Subpart I Standards of Performance for Asphaltic Concrete Plants, that regulates the concentration of particulate matter than can be exhausted from the asphalt plant operation; and Regulation XIII New Source Review, for preconstruction review of new stationary source. The most pertinent of these Rules and Regulations are discussed in greater detail in the following paragraphs.

Rule 403, reproduced in Exhibit 2, would regulate the dust generated by operations on-site including dust generated along unpaved roadways within the project and from excavation. Dust from storage or handling of aggregate (including truck transport) has to be controlled such that the presence of dust does not remain visible in the atmosphere beyond the property line of the emission source. For excavation operations all "reasonable" precautions must be taken to minimize dust generation. This is generally recognized as requiring watering of any grading or excavation site.

Regulation XIII, New Source Review, specifies preconstruction review requirements for new or modified stationary source projects. This regulation is designed to ensure that these projects do not "*...interfere with the progress in attainment of the national ambient air quality standards, without unnecessarily restricting future economic growth within the District*". The provisions in this regulation specify a limit on the net emission increase of any non-attainment air pollutant. The most important provision of the regulation in terms of the Corona Quarry project is that emissions from Particulate Matter is limited to no more than 150 pounds per day for processing operations with emissions above that level to be completely off-set. The regulations also limits the emissions from Carbon Monoxide to 550 lbs./day, Sulfur Dioxide to 150 lbs./day, Nitrogen Oxides to 100 lbs./day, Reactive Organic Gases to 75 lbs./day, and Lead Compounds to 3 lbs./day. Note: These limits apply to the processing component of the project, and not fugitive dust generation or off-site vehicular use.

In 1987, Governor Deukmejian signed Senate Bill 151 into law which gives the SCAQMD significant new powers. The law instructs the SCAQMD to develop new transportation control measures and to develop rules for indirect sources (i.e., shopping centers, stadiums, and facilities which attract a large number of vehicles). The District is also required to develop further programs and regulations that would increase ridesharing and limit heavy-duty truck

Rule 403. Fugitive Dust

(a) A person shall not cause or allow the emissions of fugitive dust from any transport, handling, construction or storage activity so that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source. (Does not apply to emissions emanating from unpaved roadways open to public travel or farm roads. This exclusion shall not apply to industrial or commercial facilities.)
(b) A person shall take every reasonable precaution to minimize fugitive dust emissions from wrecking, excavation, grading, clearing of land and solid waste disposal operations.
(c) A person shall not cause or allow particulate matter to exceed 100 micrograms per cubic meter when determined as the difference between upwind and downwind samples collected on high volume samplers at the property line for a minimum of five hours.
(d) A person shall take every reasonable precaution to prevent visible particulate matter from being deposited upon public roadways as a direct result of their operations. Reasonable precautions shall include, but are not limited to, the removal of particulate matter from equipment prior to movement on paved streets or the prompt removal of any material from paved streets onto which such material has been deposited.
(e) Subsections (a) and (c) shall not be applicable when the wind speed instantaneously exceeds 40 kilometers (25 miles) per hour, or when the average wind speed is greater than 24 kilometers (15 miles) per hour. The average wind speed determination shall be on a 15 minute average at the nearest official air-monitoring station or by wind instrument located at the site being checked.
(f) The provisions of this rule shall not apply to agricultural operations.

traffic on freeways during rush hours. A Draft AQMP was released in the fall of 1988, with formal adoption expected in early 1989.

The AQMP will set forth the SCAQMD's program aimed at achieving healthful levels of air quality. It is anticipated that the plan will include new stationary and mobile source controls such as trip reduction requirements established in Regulation 15. The plan takes into account regional growth levels as reflected in February 1987 data provided by the Southern California Association of Governments (SCAG). These data are based on land use development expected to occur pursuant to adopted city and county general plans. Attainment of all federal and state ozone and PM10 health standards as adopted by the District Board is to occur no later than December 31, 2007. For nitrogen dioxide and carbon monoxide the deadlines are December 31, 1996 and December 31, 1997, respectively.

Once the 1988 AQMP revision is adopted locally, and approved by the California Air Resource Board, it will be included in the State Implementation Plan (SIP). It will then serve as the framework for all future air pollution control efforts in the South Coast Air Basin. In developing the AQMP, all the potential control measures that could be available by the year 2007 were identified and, to the extent possible, their emission reductions were quantified. These control measures were categorized into three tiers, based upon their readiness for implementation.

The short-term, or Tier I, component of the AQMP is action-oriented. It identifies specific control measures for which control technology exists now. For the most part, these measures can be adopted within the next five years, prior to the next AQMP update. They consist mainly of stationary source controls that will be the subject of district rules and ARB-adopted tailpipe emissions standards and performance requirements for motor vehicles. Transportation and land use controls and energy conservation measures are also included in Tier I of the plan, to the extent that technology is available to accomplish the emissions reduction targets. Tier I control measures are expected to be implemented by 1993 except for facility construction which may continue up to 2007.

Tier II measures include already-demonstrated control technologies, but require advancements that can reasonably be expected to occur in the near future. When necessary, these advancements are promoted through regulatory action, such as setting standards at levels that force the advancement of existing technology, or establishing a system of emission charges that provide an economic incentive to reduce emissions.

Tier II measures focus mainly on transportation sources and the use of coatings and solvents. All the Tier II goals are expected to be achieved by 2000 except for transportation facility construction which may continue up to 2007. Tier III goals depend on substantial technological advancements and breakthroughs that are expected to occur throughout the next two decades. This requires an aggressive expansion of Tier II research and development efforts. After achieving Tier II goals, Tier III measures must be implemented on an accelerated schedule to achieve attainment by 2007.

1.3 Monitored Air Quality

Air quality at any site is dependent on the regional air quality and local pollutant sources. Regional air quality is determined by the release of pollutants throughout the air basin. Estimates for the South Coast Air Basin have been made for existing emissions ("Final Air Quality Management Plan, 1982 Revision," October 1982). The data for year 1979 indicate that mobile sources are the major source of regional emissions. Motor vehicles (i.e., on-road mobile sources) account for 50 percent of reactive hydrocarbon emissions, 58 percent of nitrogen oxide emissions, and 85 percent of carbon monoxide emissions.

The nearest air monitoring station operated by the SCAQMD is in Norco-Corona. The data collected at this station is considered to be representative of the air quality experienced in the vicinity of the project area. The project site is in the SCAQMD's Source Receptor Area 22, for which the designated monitoring station is Norco-Corona. The only data monitored at the Norco-Corona station is ozone. To supplement this information, monitoring data for other pollutants obtained from the Riverside-Rubidoux station is also presented. This air quality data for 1983 through 1986 for the Norco-Corona station and the Riverside-Rubidoux station is provided in Table 1. Note the Corona station is probably more representative of the air quality in the project area. The Riverside station is located in and downwind of highly developed areas.

The air quality data indicate that ozone is the air pollutant of primary concern in the Norco-Corona area. Ozone standards are exceeded 1 out of every 3 days. Ozone is a secondary pollutant; it is not directly emitted. Ozone is the result of the chemical reactions of other pollutants, most importantly hydrocarbons and nitrogen dioxide, in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in Norco-Corona. All areas of the South Coast Air Basin contribute to the ozone levels experienced at Norco-Corona, with the more significant areas being those directly upwind. The major metropolitan area of Los Angeles contributes heavily to the ozone levels experienced in the area. The ozone levels at the Norco-Corona station have remained about the same for the last several years.

Particulates levels in the area are due to natural sources, grading operations, and motor vehicles. It should be noted that the California and Federal standard for total suspended particulates has been redefined to particles less than 10 micrometers aerodynamic diameter (PM10). The revised standards are 30 ug/m^3 (annual geometric mean) and 50 ug/m^3 (24 hour average) for the State and 50 ug/m3 (annual geometric mean) and 150 ug/m3 (24 hour average) for the Federal. Particulate data indicates that particulates exceeded the State standards most of the time each year. The total suspended particulate concentrations (TSP) only occasionally exceed the old TSP primary standard.

State and federal standards for lead, nitrogen dioxides, carbon monoxide, sulfur oxides, and sulfates were not violated at the station. Concentrations of carbon monoxide are attributable mainly to vehicular traffic.

Table 1
AMBIENT AIR MONITORING AIR QUALITY LEVELS
(Norco-Corona and Riverside-Rubidoux

Pollutant	California Standard	National Standard	Year	Maximum Level	Days State Std. Exceeded
Ozone	0.10 ppm for 1 hr.	0.12 ppm for 1 hr.	1983	0.35	141
			1984	0.30	137
			1985	0.35	147
			1986	0.27	140
			1987	0.24	139
Particulates* (PM10)	50 ug/m3 for 24 hr.	150 ug/m3 for 24 hr.	1984	208	71%*
			1985	208	77%
			1986	294	79%
			1987	219	77%
Particulates (TSP)			1983	285	
			1984	278	
			1985	335	
			1986	346	
			1987	305	
CO	20 ppm for 1 hr.	35 ppm for 1 hr.	1983	8.0	0
			1984	8.0	0
			1985	8.0	0
			1986	9.0	0
			1987	9.0	0
Nitrogen Dioxide	.25 ppm for 1 hr.	.0532 ppm annual avg.	1983	0.19	0
			1984	0.17	0
			1985	0.16	0
			1986	0.16	0
			1987	0.21	0

NOTES:
1. Sulfates, lead, and sulfur dioxide standards were not exceeded at any of the Riverside County stations.
2. Days exceeding standard for particulates are reported in terms of percent days per year.
3. Particulate standard for California was changed in 1984 and by the Federal Government in 1987 to include only matter with an aerodynamic diameter of 10 micrometers or less (PM10). The superseded Total Suspended Particulate standards for twenty four hours were 100 ug/m3 for the state and 260 ug/m3 for the Federal.
4. Data for ozone is from the Norco Corona Station. All other data is from the Riverside-Rubidoux Station.

2.0 POTENTIAL AIR QUALITY IMPACTS

The air quality emissions of the project can be sub-divided as follows:

- *Processing Emissions*
  - *Asphalt Plant*
  - *Concrete Plant*
  - *Aggregate Processing*
  - *Equipment Combustion Emissions*
- *Fugitive Dust Generation*
- *Off-Site Vehicular*

Each of these sources is discussed individually, and the combined emissions are addressed relative to regional air impacts. This analysis is based upon an ultimate buildout production rate of 5 million tons of aggregate processing per year. This worst case production rate would not be reached until the 10 to 20 year time frame. The five year production rate is 1 million tons per year. The five year emissions could be derived by dividing these worst case emission projections by five.

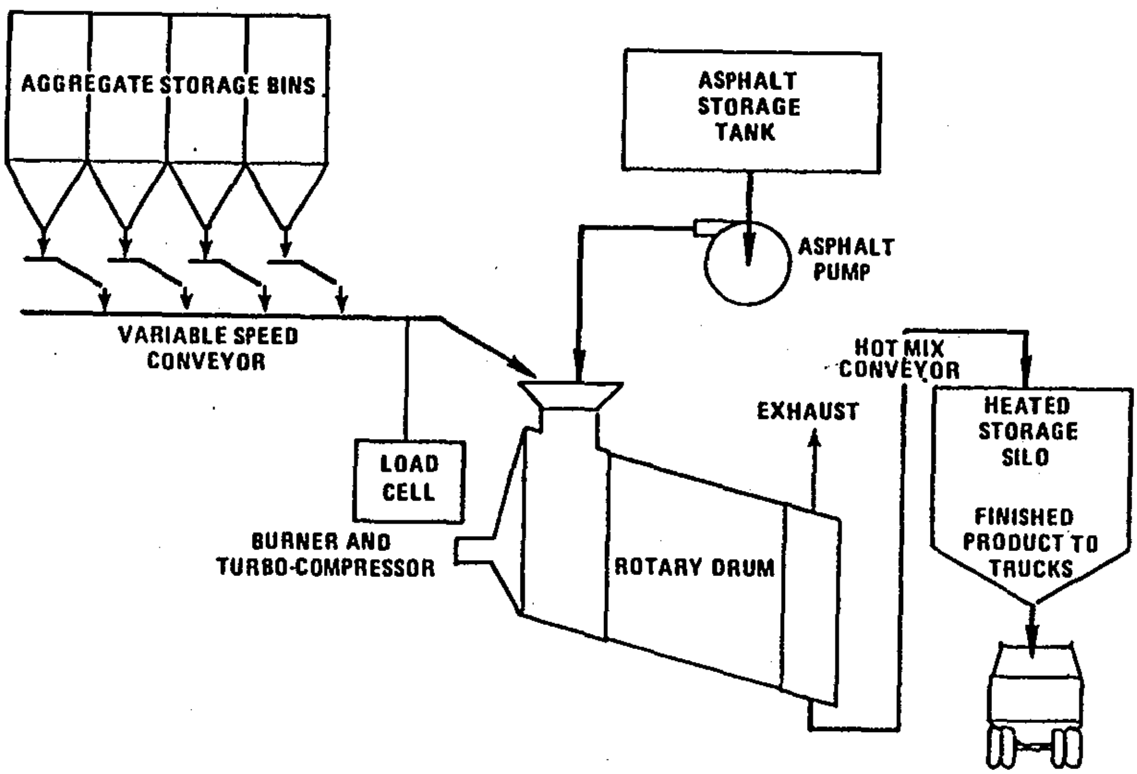
2.1 Processing Emissions

Processing emissions are those emissions associated with the asphalt, concrete and aggregate production. These emissions include combustion emissions from the equipment and the processing as well as particulate emissions during the processing.

The principal emission from rock quarry production is particulates. The amount of particulate emissions will vary depending upon the level of emission controls to be used. The SCAQMD Regulation XIII would effectively limit the particulate emissions from this facility to 150 lbs./day, with any emissions above this level to be completely off-set. An example of emissions from the processing with typical control equipment is presented the following paragraphs. The exact emissions will vary depending upon the control equipment selected, however, the total particulate emissions from processing contributed to the local region can not exceed 150 lbs./day. (Note: The regulations also limits the emissions from Carbon Monoxide to 550 lbs./day, Sulfur Dioxide to 150 lbs./day, Nitrogen Oxides to 100 lbs./day, Reactive Organic Gases to 75 lbs./day, and Lead Compounds to 3 lbs./day. These limits apply to the processing component of the project, and not fugitive dust generation or off-site vehicular use.

2.1.1 Asphalt Plant. Asphaltic concrete is a paving material which consists of a combination of graded aggregate that is dried, heated and evenly coated with hot asphalt cement. Construction of most new asphalt plants favor the dryer drum process (Exhibit 3). In this process the wet aggregate is dried and mixed with hot liquid asphalt cement simultaneously in a dryer. Emissions from the burner and rotary drum are usually vented through a common stack.

The "Compilation of Air Pollutant Emission Factors, Volume 1. Stationary Point and Area Sources, Fourth Edition," (by the U.S. Environmental Protection Agency, September 1985, AP-42) provides emission factors for asphalt plants. (This document is commonly referred to as "AP-42.") The emission factors in AP-42 were combined to project emissions for the



Shearer type dryer-drum hot asphalt plant.

Exhibit 3
Asphalt Plant Process

asphalt plant. The emission factors used in this analysis are presented in the Appendix. The future asphalt production rates were combined with the emission factors to estimate the emissions generated. These emissions are based upon an assumed rate of 600,000 tons per year of asphalt. It can be assumed that the facility would be equipped with a baghouse or other suitable control device as required by Regulation IX Subpart I Standards of Performance for Asphaltic Concrete Plants. It was also assumed that the fuel consumed would contain 0.05% sulfur. Estimates for the emissions from the asphalt plant area presented in Table 2. The particulate emissions from the asphalt plant will be limited by Regulation XIII so that the entire particulate emissions from the processing operations are less than 150 lbs./day.

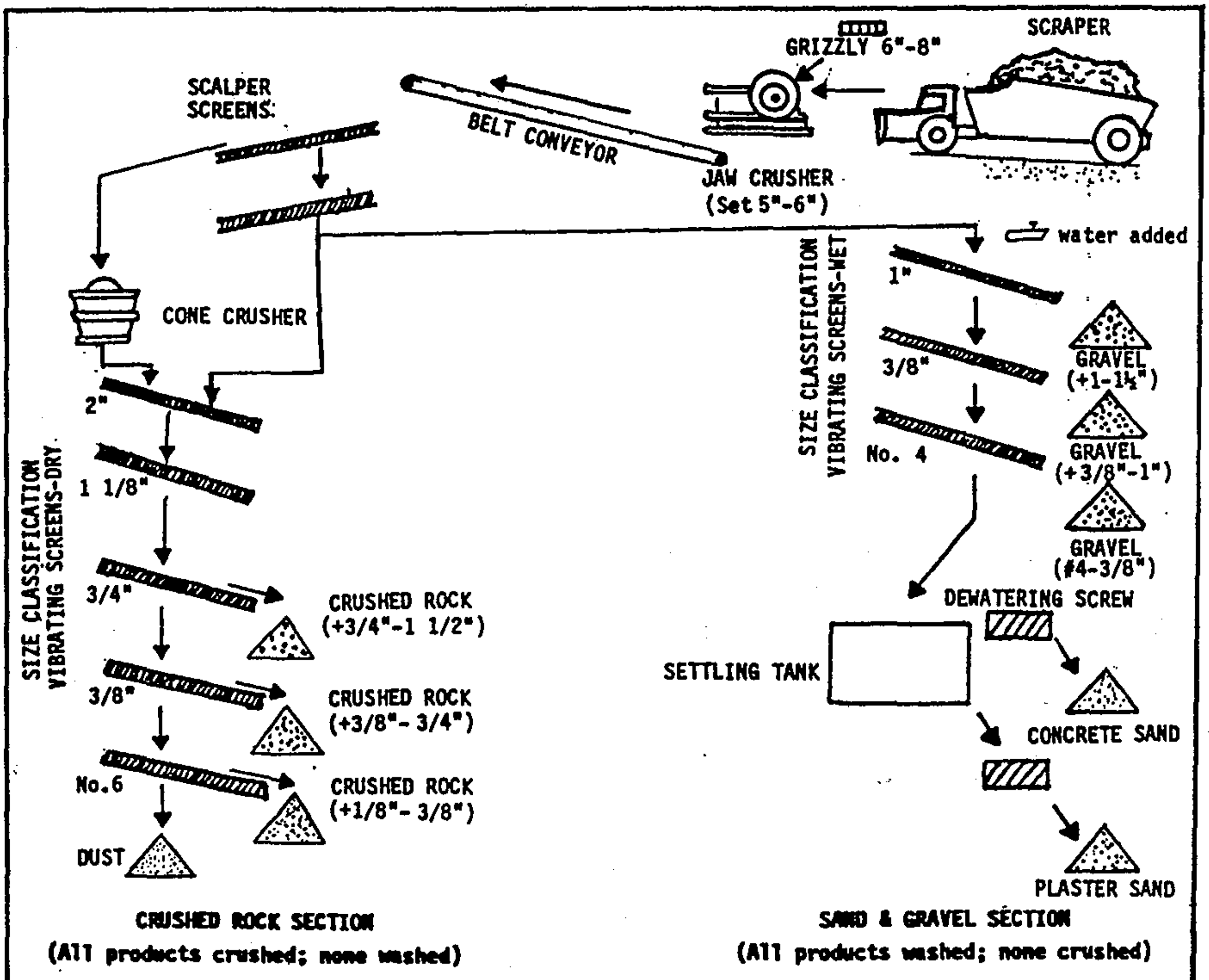
2.1.2 Concrete Plant. Particulate emissions are part of concrete plant operations. Concrete batching involves the proportioning of sand, gravel, and cement by means of weigh hoppers and conveyors into a mixing receiver such as a transmit mix truck. The required amount of water is also discharged into the receiver along with the dry materials. Particulate emissions consist primarily of cement dust, but some sand and aggregate gravel dust emissions do occur during batching operations. Control techniques include the enclosure of dumping and loading areas, the enclosure of conveyors and elevators, filters on storage bin vents, and the use of water sprays. The emissions can be reduced by greater than tenfold with these devices.

Emission factors in AP-42 can be used to project emissions for the concrete plant (Appendix). The future production rates were combined with the emission factors to estimate the emissions generated. These emissions are based upon a future buildout production rate of 875,000 yards per year. The particulate emissions from the concrete plant will be limited by Regulation XIII so that the entire particulate emissions from the processing operations are less than 150 lbs./day.

2.1.3 Aggregate Processing. Particulate emissions are a result of aggregate processing operations. The processing of sand and gravel for a specific market involves the use of different combinations of washers, screens and classifiers to segregate particle sizes; crushers to reduce oversize material; and storage and loading facilities. A diagram of this process is presented in Exhibit 4. Emission sources include primary and secondary crushing, screening, conveying, stacking, loading and active storage. The use of wet processing and dust collecting equipment can provide substantial control of the particulate emissions. These emission control systems can reduce the particulate emissions by 99.9 percent. The AQMD will determine the level of controls in order to ensure consistency of the project with the air quality regulations. The particulate emissions from the aggregate processing will be limited by Regulation XIII so that the entire particulate emissions from the processing operations are less than 150 lbs./day.

Included as part of the particulate emissions are the unpaved haul road emissions from dust generation. The reduction of haul road emissions can be reduce by the use of soil stablizers as required by SCAQMD Rule 403.

2.1.4 Equipment Combustion Emissions. Heavy-duty equipment emissions are difficult to quantify because of day to day variability in excavation activities and equipment used. Typical emission rates (in terms of pounds of pollutant per gallon of fuel burned) for gas powered and diesel powered equipment is provided in the Air Quality Handbook prepared by the South Coast Air Quality District (April 1987). These emission rates are presented in the Appendix. At typical fuel consumption rates of about 5 gallons per hour, emission rates from equipment activities range from about 2 to 6 pounds per hour per piece of on-site equipment. For this type of project 10 pieces of equipment may be expected to operate at one time. Assuming the



FLOWSHEET OF
AGGREGATE-PROCESSING PLANT

Exhibit 4
Aggregate Process

equipment operated was 70 percent gasoline and 30 percent diesel and operated for 8 hours per day these emissions were estimated. These emissions are presented in Table 2.

2.1.5 Total Processing Emissions. The total processing emissions for the project are presented in Table 2. This table also shows the maximum emission rates for each pollutant allowed by Regulation XIII. The proposed Corona Quarry project will be required to go through New Source Review by the SCAQMD to demonstrate compliance with these emission limit requirements. Any control measures necessary to meet these limits are specified at that time.

Table 2
TOTAL EMISSIONS (Pounds per Day)

	CO	NO_x	SO_x	PART	HC
Asphalt Plant	61	58	1	--	45
Concrete Plant				--	
Aggregate Processing				--	
On-site Equipment Combustion	304	40	6	5	19
Total	365	98	7	150	64
SCAQMD Regulation XIII Limits	550	100	150	150	75

-- Note: The combined particulate emissions from all processing sources are required to be less than 150 lbs./day.

2.2 Fugitive Dust Generation

Dust will be generated from the mining and transport activities. Grading activities are estimated by the U.S. Environmental Protection Agency ("Compilation of Air Pollutant Emission Factors" AP-42). These emissions are as a result of drilling, blasting and earth moving. AP-42 emission factors for grading activities are estimated to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust as required by SCAQMD Rule 403, the emissions can be reduced by 50 percent. Approximately 1 acre of surface would be worked in any one day. Assuming typical control techniques, the drilling, blasting and grading activities are estimated to results in an estimate of 104 pounds per day of particulate emissions released. These emissions were calculated from AP-42. Common practice for minimizing dust generation is watering prior to and during excavation. Note that these particulate emissions are primarily large particulates that tend to settle out of the atmosphere. Only 20 percent of these emissions are of the 10 microns or less size.

2.3 Off-Site Vehicular Emissions

Vehicular emissions for the project can be divided into truck and non-truck emissions. The project will result in substantial truck traffic for the delivering of the processed materials.

The traffic study estimates that the project will result in 1,740 truck trips per day. It was estimated that an average truck trip would be 20 miles. This is based on the fact that there are similar facilities throughout Southern California and it is not cost effective to travel long distances for aggregate. An estimate of 34,800 truck miles per day results. Emission factors for heavy duty diesel trucks were obtained from EMFAC7C for the year 2005 and are presented in the Appendix.

Estimates of the non-truck emissions generated by the proposed project were also made. Emission are based on the Air Quality Handbook (April 1987) for the year 2002. An average vehicle speed of 20 miles per hour was assumed for the projections. These emission factors are also presented in the Appendix. The traffic report for the project forecasts 40 non-truck trips per day due to the project. Combining this with an average of 15 miles per trips results in a VMT of 600. The projected off-site truck and non-truck vehicular emissions for the project are presented in the first column of Table 3.

It is important to note that the project itself does not generate this truck traffic but only provides material that is being purchased by these haulers for use on construction project. These emissions are emissions that would be displaced from other existing rock quarries. Driving distances is a major cost factor for quarry material, therefore, it is cost effective to purchase the material from the closest quarry. The project is providing a source of quarry material to Riverside County that will be closer to construction sites in this area of the county. Therefore the vehicle miles traveled for the trucks will actually be reduced.

The average truck trip length required to serve Riverside County from existing quarry facilities was estimated. This estimated number is approximately 35 miles per trip. In order to present a worst case analysis, the average truck trip length using current quarries was assumed to be 30 miles. The second column of Table 3 shows the future off-site vehicular emissions for trucks using current quarries. The third column shows the reduction in regional emissions as a result of the shorter travel distances when using the Corona Quarry.

Table 3
FUTURE OFF-SITE VEHICULAR EMISSIONS

Pollutant	Project Emissions (Pounds/day)	Off-Site Truck Emissions Using Current Quarries (Pounds/day)	Reduction in Emissions as a Result of Shorter Truck Trip Length (Pounds/day)
Carbon Monoxide	1393	2076	683
Hydrocarbons	240	359	119
Nitrogen Oxides	839	1256	417
Particulates (TSP)	254	380	126
Sulfur Oxides	221	322	101

2.7 Total Emissions

The total emissions for the project are summarized and totaled below in Table 4.

Table 4
TOTAL EMISSIONS (Pounds per Day)

	CO	NO_X	SO_X	PART	HC
Processing Emissions	365	98	7	150	64
Fugitive Dust Generation				104	
Off-Site Vehicular	1393	839	215	254	240
Total	**1758**	**937**	**222**	**508**	**304**
Reduction as a result of shorter truck travel distance	683	417	101	126	119
Total	**1075**	**520**	**121**	**382**	**185**

Note: The particulate emissions for processing are limited to 150 lbs./day.

The total emissions generated by the project are compared to emissions for Riverside County in Table 5. The Riverside County emissions are for 1987 and are from the 1982 Revision to the Air Quality Management Plan. Table 5 also presents the emissions for Source Receptor Area 22 (projected year 1987). The emission estimates are from the "Air Quality Handbook," by the SCAQMD. Source Receptor Area 22 includes the project site. The result show that the future ultimate buildout of the project does not result in a significant increase in emissions in Riverside County. These emissions are discussed in the next paragraph.

Table 5
COMPARISON OF EMISSIONS

	CO	NO_X	SO_X	PART	HC
Emissions (tons/day)					
Total Project Emissions	0.54	0.26	0.06	0.19	0.09
1987 Riverside County	504.5	68.4	6.34	147	222
1987 Source Receptor Area 22	70.28	11.67	N.A.	N.A.	11.02
Project as a % of County Emissions	0.1%	0.4%	0.9%	0.6%	<0.1%
Project as a % of Receptor Area 22	0.8%	2.2%	N.A.	N.A.	0.8%

The results show that the Rules and Regulations as part of the SCAQMD emission control measures presented in the report, will reduce the emissions from this project. The Air Quality Management District requires that the project be consistent with the Air Quality Maintenance Plan. The SCAQMD New Source Review will specify the level of controls necessary to meet the AQMP requirements to reduce the emission to a level of insignificance.

It is important to point out that the particulate emission generated by the project are preeminently of the larger size that tend to fall out of the atmosphere onto or downwind of the site itself. (Approximately 20 percent of the fugitive dust emissions are less than 10 microns in size.) These are not the by-products of combustion particulates of 10 micrometers or less than are considered more a health hazard. The project site is located in an area that such that the predominant downwind direction (to the east) is away from the residential developments. This area is a hilly undeveloped area. The requirements of Rule 403 will minimize the fugitive dust emissions.

The predominant source of emissions for the remaining pollutants (CO, NOX, SOX and HC) is the off-site truck traffic. It is important to note that the project itself does not generate this truck traffic but only provides material that is being purchased by these haulers for use on there construction project. These emissions are emissions that would be displaced from other existing rock quarries. The project is providing another source of quarry material that is closer to more construction sites. Therefore the vehicle miles traveled will actually be reduced.

3.0 MITIGATION MEASURES

The project will have to comply with the Rules and Regulations of the South Coast Air Quality Management District. Compliance with these rules, particularly Regulation XIII and Rule 403 will result in acceptable air quality levels in adjacent areas. The specific control methods to reduce emissions will be determined by the AQMD that will ensure that the project is consistent with the AQMP.

Regulation XIII, New Source Review, specifies preconstruction review requirements for new or modified stationary source projects. The provisions in this regulation specify a limit on the net emission increase of any non-attainment air pollutant. The Best Available Control Techniques (BACT) will be specified to meet these emission limits. Potential measures include: enclosures on dumping and loading areas; enclosures on conveyors and elevators; filters on storage bin vents; use of wet processing; bag housing to collect dust; and unpaved roadway control measures.

Controlling dust emissions on unpaved roadways include paving, surface treatment with chemicals, working chemical stabilizers into the roadbed, watering, and traffic control measures. Chemical stabilizers include those used to increase moisture retention and to bind particles into larger sizes. They are often the most effective method of controlling dust on unpaved haul roads. Speed limits on these roadways can also minimize the emissions.

Rule 403 would regulate the dust generated by operations on-site including dust generated from grading, blasting and along unpaved roadways within the project. Dust from storage or handling of aggregate (including truck transport) has to be controlled such that the presence of dust does not remain visible in the atmosphere beyond the property line of the emission source. Watering of any grading, quarry face or excavation site, and the control of haul road dust emissions are common measures used to meet Rule 403.

During the rare times when the daytime winds are out of the west, additional mitigation measures to minimize particulate emissions in the local residential area should be considered. These measures include increased use of watering during grading activities and blasting or delaying of blasts for more favorable wind conditions.

4.0 SIGNIFICANCE OF IMPACTS

Compliance with the SCAQMD Rules and Regulations will result in mitigation of impacts. No significant impacts are projected after mitigation.

APPENDIX

Table A-1
ASPHALT PLANT EMISSION FACTORS

Pollutant	Emission Factor (Pounds/ton)
Carbon Monoxide	0.038
Hydrocarbons	0.028
Nitrogen Oxides	0.036
Particulates (TSP)	0.020
Sulfur Oxides	0.0007

Table A-2
TYPICAL CONTROLLED CONCRETE PLANT EMISSION FACTORS

Pollutant	Emission Factor (Pounds/yards)
Particulates (TSP)	0.02

Table A-3
EMISSION RATES FOR HEAVY DUTY EQUIPMENT
(lbs. per gallon of fuel)

POLLUTANT	EMISSION RATE GASOLINE	DIESEL
Carbon monoxide	1.02	0.19
Nitrogen oxides	0.16	0.19
Hydrocarbons	0.06	0.02
Sulfur oxides	0.01	0.03
Particulates	0.01	0.02

Table A-4
OFF-SITE VEHICULAR TRAFFIC EMISSIONS

Pollutant	Truck Emission Factor (Grams/mile)	Non-Truck Emission Factor (Grams/mile)
Carbon Monoxide	18.05	6.07
Hydrocarbons	3.12	0.53
Nitrogen Oxides	10.92	1.10
Particulates (TSP)	3.30	0.27
Sulfur Oxides	2.8	0.20

Appendix 5.8

Biotic Report

Surface Mining Permit No. 168: Biological Assessment

Stephen J. Myers
Lawrence F. LaPre', PhD
Tierra Madre Consultants
October, 1988

Introduction

This report was contracted by Florian Martinez Associates as part of the baseline data necessary for consideration of a surface mining permit and reclamation plan by the Riverside County Planning Department and other concerned regulating agencies. The property described in this report is a 337 acre parcel located east of Cajalco Street and south of Magnolia Avenue, in the Corona area. The legal description of the property location is township 3 south, range 6 west, portion of section 33, and township 4 south, range 6 west, portion of section 4. As proposed by Surface Mining Permit No. 168, the property will be developed into an aggregate quarry, batch plant and asphalt plant. The biological resources of the project area are described, potential impacts to those resources as a result of the proposed project are discussed, and recommendations are made for mitigation measures intended to minimize those impacts.

Methods

A literature review was conducted to identify any sensitive elements which are known to occur on or in the vicinity of the property. This included consultation with the California Natural Diversity Data Base (Data Base), and a review of the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California. Previous biological reports performed on projects in the area were reviewed, with particular attention paid to occurrences of Stephens kangaroo rat.

Field surveys were then performed by Stephen Myers and Lawrence LaPre' on September 14 and by Stephen Myers on September 23 and 26, 1988. The site was traversed on foot and by car and all plant and animal species detected were recorded in field notes. Plant species of uncertain identity were collected and subsequently identified by Andrew C. Sanders, herbarium curator at the University of California, Riverside campus, or by Maureen Pendleton, a TMC botanist. All species are referred to in the text by their common names. Complete species lists, using both scientific and common names, are included at the end of the report.

Because a portion of the project site is within the known range of Stephens' kangaroo rat, a species listed as endangered by the federal government and threatened by the State of

California, a small mammal trapping survey was performed covering those areas of the property on which kangaroo rat sign was observed. One hundred and sixty Sherman live traps, baited with rolled oats and bird seed, were set by Stephen Myers and Robin Bishop on the evening of September 29, 1988. On the evening of October 4 Myers set an additional 80 traps, baited with peanut butter, oats, and bird seed. All traps were recovered on the following mornings. Captured animals were identified and released unharmed at the point of capture.

Results

Soils

The soil survey for the Western Riverside County area indicates six soil types on the subject property:

CaD2- Cajalco fine sandy loam, 8 to 15 percent slopes, eroded.
CaF2- Cajalco fine sandy loam, 15 to 35 percent slopes, eroded.
CpA- Cortina gravelly sandy loam, 0 to 2 percent slopes.
PlD- Placentia fine sandy loam, 5 to 15 percent slopes.
RuF- Rough broken land
TbF2- Temescal rocky loam,15 to 50 percent slopes, eroded.

These soil types are widespread in Riverside County, and are not known to support unusual vegetation or to be substrate for plant species of limited distribution that are associated only with specific soil types.

Vegetation and flora

With the exception of two areas containing riparian vegetation, the entire site consists of somewhat degraded non-native annual grassland and coastal sage scrub communities. It appears that the site formerly contained a greater percentage of coastal sage scrub. Many years of stock grazing, along with frequent wildfires, probably accounts for most of this degradation. The annual grassland and coastal sage scrub on the property have more or less intergraded into a single community. It is unknown whether introduced grassland species are crowding out coastal sage scrub, or if coastal sage scrub is regenerating within the non-native grassland areas. Dominant coastal sage scrub species on the site include brittlebush and California sagebrush, with lesser amounts of California buckwheat, laurel sumac, black sage, and Palmer's goldenbush. The understory is comprised mainly of the same species which dominate the annual grassland: red brome, slender wild oat, ripgut grass, abu mashi, short-pod mustard, star-thistle, red-stem filaree, doveweed, and fiddleneck. Several other weedy species occur mainly along roadsides on the property such as common sunflower, telegraph weed, western ragweed, and wild lettuce.

Riparian communities occur in two drainages on the property. The first includes a portion of Temescal Wash. The highest quality riparian habitat in this area appears to be the result of run-off from the asphalt plant to the south. This water flows into a pit, part of which is on the CalMat property. The total area of the pit is approximately 5.7 acres, of which about half receives run-off and has developed a willow riparian woodland/freshwater marsh of high quality. The other half of the pit, which is entirely on CalMat property, is about ten feet higher than the riparian area, and is in a disturbed state, containing mostly weedy species such as red brome, short-pod mustard, and London rocket. Black willow is the dominant tree in the willow riparian woodland, with mulefat, tamarisk, young arroyo willow, and freshwater marsh plants forming the understory. The center of the riparian area contains an open pond (perhaps one acre), surrounded by willows, with an open freshwater marsh between the pond and the riparian strip on the south side of the pit. Dominant species in the marsh are tule cattail, fragrant flat sedge, marsh fleabane, tamarisk, water smartweed, and emergent black willow.

Approximately 1200 feet of Temescal Wash crosses the project site. Compared to the pit, this area is much drier. Vegetation in the wash is overwhemingly dominated by mulefat. Emergent black willow is present, mostly along the margins of the wash, and giant reed and tamarisk (both introduced) are invading the area.

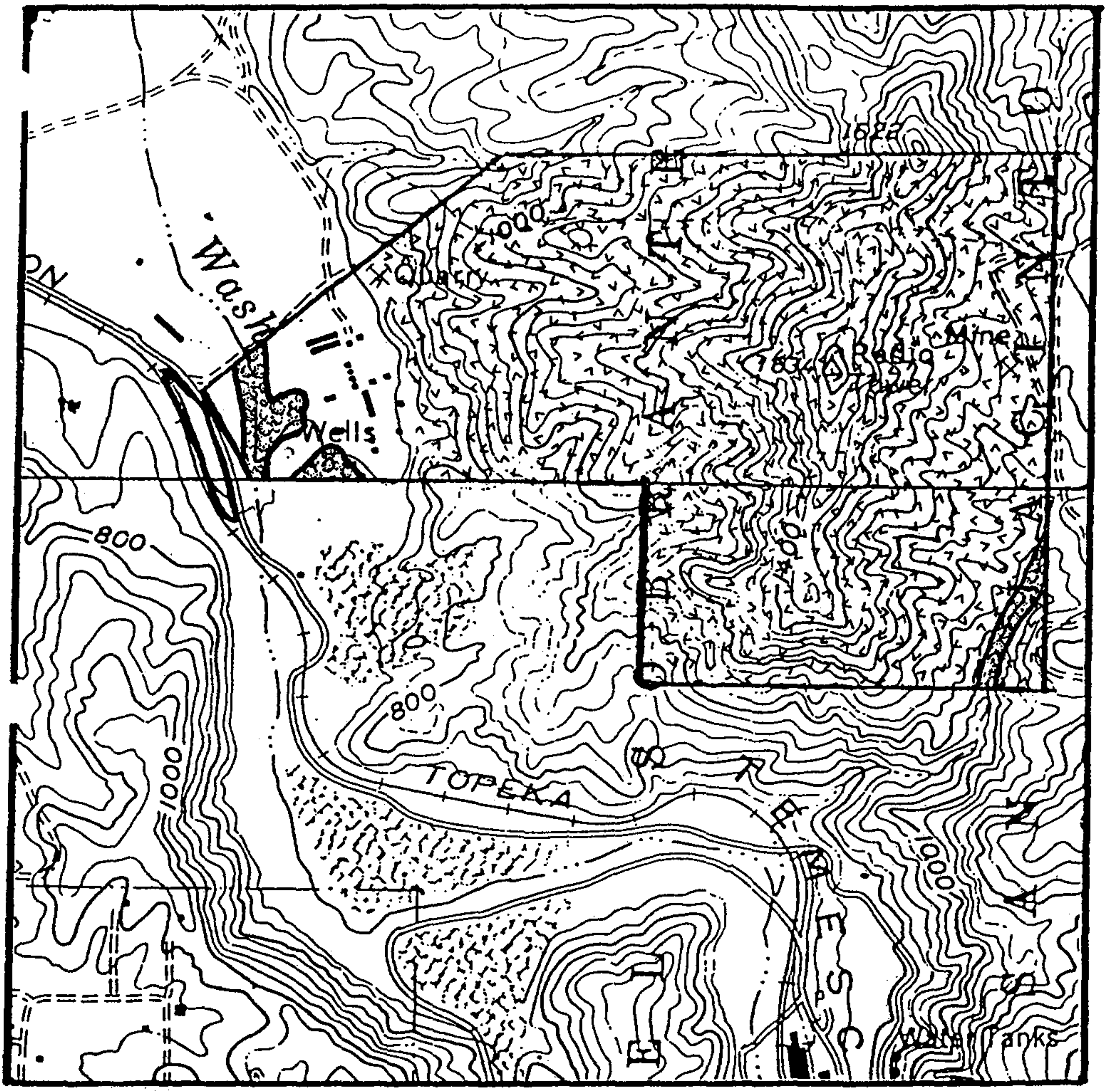
The other riparian area on the site is located along the easterly boundary, near the southeast corner. This drainage contains a willow/mulefat riparian scrub community. This community is dominated by mulefat, with clumps of tree-sized black willows occurring at various points along the drainage. One side canyon perpendicular to and west of this drainage contains an especially well-developed, although small, willow woodland. Willows in this area attain a height of approximately 30 feet.

Both of the riparian areas on the site are along or adjacent to intermittent blueline streams as identified on the USGS 7.5 minute Corona South quad.

Plant communities of the CalMat property are shown in Map 1.

Wildlife habitat and fauna

The most valuable wildlife habitats on the project site are the willow riparian areas. These plant communities, along with other riparian habitats, tend to have a very high density and diversity of vegetation, and a correspondingly high faunal density and diversity. Birds are especially abundant in riparian ecosystems. Riparian forests support more species of breeding birds in California than any other habitat type and at least 100 species use it for food and cover (Gaines, 1977). Riparian areas



MAP 1. PLANT COMMUNITIES OF THE SITE OF SMP 168.

RIPARIAN SCRUB/WOODLAND

SPARSE COASTAL SAGE SCRUB/ANNUAL GRASSLAND

SCALE IN MILES

0 1/4 1/2

MAP SOURCE: USGS 7.5' CORONA SOUTH QUAD

Tierra Madre Consultants

also result in an increase in avian diversity of nearby and adjacent natural communities. Thirty-seven species of birds were recorded on the field surveys, the vast majority occurring in the willow riparian communities. The riparian area in the pit, since it contains year-round surface water (presumably), is very important to local animals as a source of water. During the field surveys, tracks of raccoons and coyotes were evident in mud surrounding the pond. Pacific treefrogs and bullfrogs were observed around the margins of the pond.

The annual grassland/coastal sage scrub on the site is less important overall as wildlife habitat. This community produces green plant material and seeds which are utilized for food by a wide variety of birds and small mammals. The areas containing moderate to dense shrub cover (coastal sage scrub) have somewhat more structural diversity than the more open areas. This increased diversity undoubtedly results in an increase in use by wildlife in these areas. Another important use of the more open areas of the property is foraging by raptors. The region immediately to the east of the project site contains among the highest concentrations of wintering raptors in Riverside County (California Department of Fish and Game, 1979).

The project site also contains numerous rocky outcrops, which are important habitat for species such as the granite spiny lizard, and provide perch sites for numerous raptors, as evidenced by abundant guano on many of the outcrops.

Sensitive species

A review of Data Base records revealed that three sensitive animals have been previously documented from the region of the project site. None of these occurrences were on the site itself. However, two additional sensitive animals were detected during the field surveys: golden eagle and California black-tailed gnatcatcher. Sensitive species and communities are so called because of their limited distribution, restricted habitat requirements, particular susceptibility to human disturbance, or a combination of these factors. Sensitive species known from the area of the subject property are presented in Table 1.

Table 1. Sensitive species considered for the site of Surface Mining Permit No. 168.

Species & Habitat	Status*	Occurrence Probability**	Number of Sightings
Phrynosoma coronatum blainvillei San Diego horned lizard Sandy areas in grassland or brush	1) C2 2) CSC	Moderate	0
Cnemidophorus hyperythrus Orange-throated whiptail Sandy washes, coastal sage scrub	1) C2 2) CSC	Moderate	0
Aquila chrysaetos Golden eagle Grasslands, mountainous areas	1)ND 2)CP, CSC	Occurs	2
Polioptila melanura californica Coastal black-tailed gnatcatcher Coastal sage scrub	1)C2 2)CSC	Occurs (year-round resident)	3
Dipodomys stephensi Stephens kangaroo rat Level to moderately sloping grasslands	1) E 2) CT	Occurs	3

* For Status Designations, see following page.
** For definitions of Occurrence Probability, see following page.

STATUS DESIGNATIONS

1) FEDERAL DESIGNATIONS

- E = Federally listed, endangered.
- T = Federally listed, threatened.
- C1 = Category 1 candidate species. Enough data are on file to support the federal listing.
- C2 = Category 2 candidate species. Threat and/or distribution data are insufficient to support federal listing.
- ND = No designation.

2) STATE DESIGNATIONS

- CE = State listed, endangered.
- CT = State listed, threatened (previously listed as rare).
- CP = Fully protected under California Fish and Game Code, Sections 3511, 4700, 5050, 5515.
- CSC = California Department of Fish and Game Species of Special Concern.
- ND = No designation.

**** Definitions of occurrence probability:**

Occurs: Observed on the site by field personnel of Tierra Madre Consultants, or recorded on-site observations by other qualified biologists.

Moderate: Reported sightings in surrounding region, habitat on the site is a type occasionally utilized by the species; or site is within the known range of the species and habitat on the site is a type occasionally utilized by the species.

Low: Site is within the known range of the species but habitat on the site is rarely used by the species.

Information sources of status descriptions are derived from the California Natural Diversity Data Base and California Native Plant Society.

The **San Diego horned lizard** frequents a variety of habitat types including coastal sage scrub, broad-leaved woodlands, and chaparral. This species is common in areas where there is loose sandy soil with low-growing brush nearby. Ants are the primary food of this species, although it also takes beetles and other insects. When this species inhabits an area, distinctive fecal pellets containing mostly ant parts are often visible.

Populations of this lizard are declining due to extensive collecting on wildlands near urban development areas and as a result of its habitat being converted to agricultural and urban lands. Based upon the condition of the habitat present on the project site, there is a moderate probability of this species' occurrence.

The **orange-throated whiptail** occupies washes and other sandy areas where there are rocks and patches of brush nearby. This species is common in coastal chaparral, thornscrub, and streamside growth. This reptile feeds on insects and spiders. Populations of this species are declining as a result of habitat loss due to land conversion for agriculture and development. The probability of this species occurring on the site is moderate.

Golden eagles nest in rugged mountainous areas which have adjacent open grassland or scrubland where prey occurs. It feeds mainly on ground squirrels, rabbits, and other small to medium-sized mammals. Its home range averages approximately 35 square miles. Threats to this species are numerous: eggshell thinning from pesticide ingestion; loss of habitat; shooting; electrocution from high-voltage power lines; and poisoning during predator control programs. No suitable nesting sites were found on the property during the field surveys, but two individuals were seen soaring over the eastern boundary. These birds undoubtedly utilize the project site for foraging purposes. A survey conducted in 1981 located a potential golden eagle nest site within approximately 2 miles from the project site.

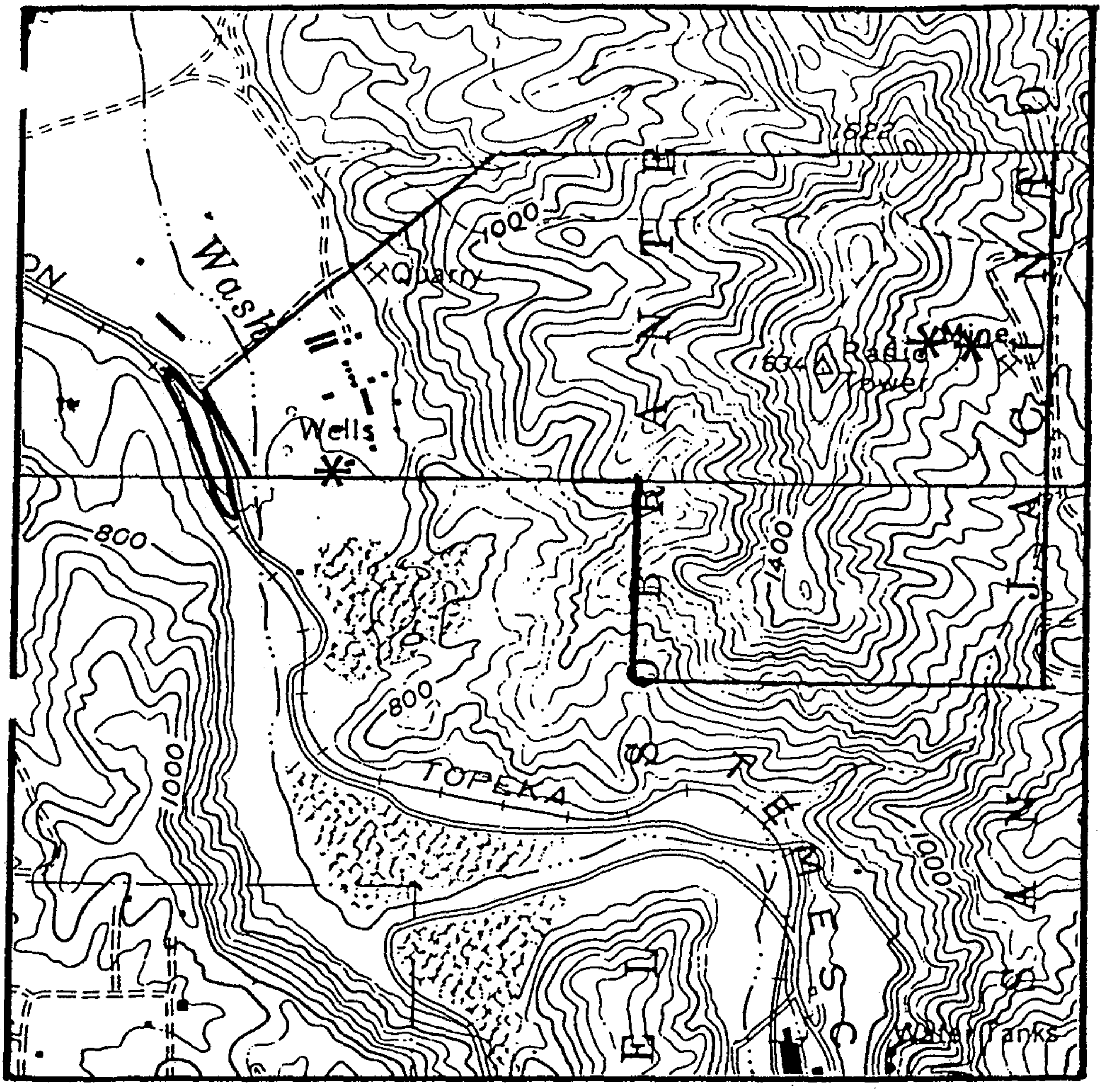
The **California black-tailed gnatcatcher** is a coastal race of black-tailed gnatcatcher which is restricted in habitat to areas containing coastal sage scrub in Southern California and Baja California. Based upon the findings of the most recent comprehensive study of this bird, it is likely that the American Ornithologists' Union will elevate it to the status of a full species (Atwood, 1988). Previous studies of this species (Atwood, 1980) revealed severely reduced population levels and a major loss of suitable habitat in recent times. This study estimated a remaining population of this race of about 1335 pairs. Approximately 400 pairs were estimated in Riverside County. A substantial amount of coastal sage scrub has been developed in Riverside County since Atwood's 1980 study. One individual was seen in the riparian area on the west side of the property during the field surveys. Although this species' breeding habitat is confined to coastal sage scrub, they are known to utilize other communities for foraging, including riparian areas. After breeding season, when the density of insects available for food decreases, the size of gnatcatcher territories increase in order to provide enough foraging habitat.

Two additional individuals were observed near the eastern property boundary in moderately dense brittlebush, which is suitable breeding habitat. Map 2 shows the locations of California black-tailed gnatcatcher sightings on the property.

The **Stephens kangaroo rat** is listed by the state of California as threatened and has been approved for federal listing as endangered. The federal endangered status will take effect on October 30, 1988. The Stephens kangaroo rat is endemic to the San Jacinto Valley and nearby valleys of western Riverside and northern San Diego counties. Level to slightly sloping terrain with vegetative cover limited primarily to annual grasses and/or herbaceous plants is the species' preferred habitat. This species is known to be sympatric with the Pacific kangaroo rat, a similar species with a much more widespread distribution.

The Stephens kangaroo rat inhabits underground burrows which it excavates or in some cases it re-excavates abandoned gopher burrows. The species is nocturnal, emerging to feed on vegetation and seeds and to bathe in dry, shallow dusty depressions (dustbaths). Kangaroo rats often cache food in their burrows or nearby holes presumably for periods when food is otherwise unavailable.

The limited range of the Stephens kangaroo rat and the conversion of its habitat to agricultural lands and developed areas are the primary factors which have contributed to its decline and led to its listing as a threatened species.



MAP 2. LOCATIONS OF BLACK-TAILED GNATCATCHER OBSERVATIONS.

SCALE IN MILES

0 1/4 1/2

* CALIFORNIA BLACK-TAILED GNATCATCHER

N

Tierra Madre Consultants

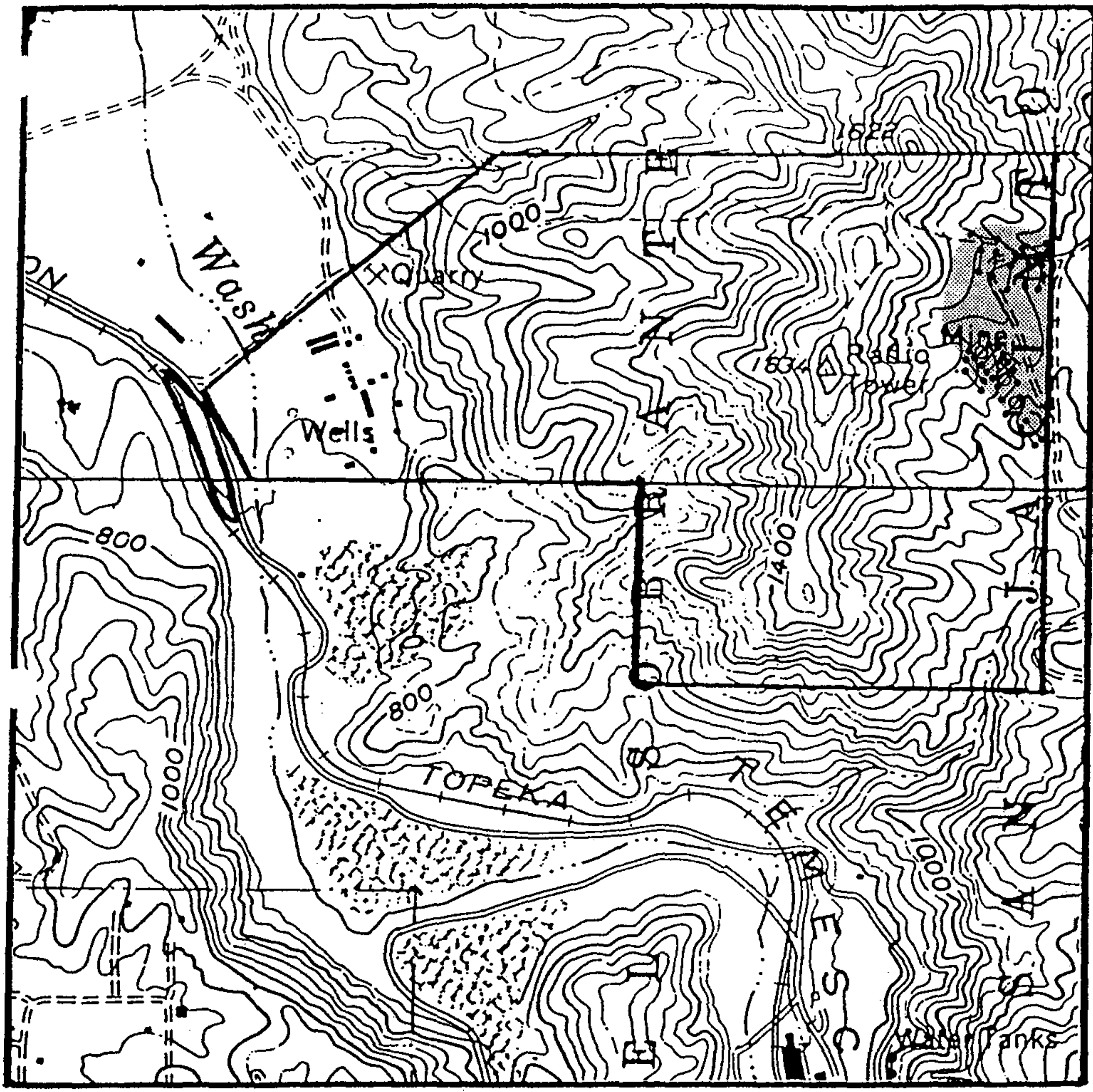
MAP SOURCE: USGS 7.5' CORONA SOUTH QUAD

Small mammal trapping survey

The trapping survey resulted in three captures of the Stephens kangaroo rat. All of these individuals were captured in an area of approximately 2 - 3 acres on the eastern property boundary. Map 3 shows the locations of the captures and of all trap lines. Complete results of the trapping survey are presented in Table 2.

Table 2. Results of small mammal trapping trapping survey on the site of Surface Mining Permit 168. Total trap-nights = 240.

SPECIES	**NUMBER OF CAPTURES**	**CAPTURE SUCCESS**
Otospermophilus beecheyi Beechey's ground squirrel	1	.4%
Perognathus fallax San Diego pocket mouse	4	1.7%
Dipodomys stephensi Stephens kangaroo rat	3	1.3%
Dipodomys agilis Pacific kangaroo rat	2	.8%
Peromyscus maniculatus Deer mouse	7	2.9%
TOTALS	17	7.1%



MAP 3. TRAP LINES & STEPHENS KANGAROO RAT (SKR) CAPTURE LOCATIONS.

SCALE IN MILES

0 1/4 1/2

TRAP LINES

SKR CAPTURES

SUITABLE SKR HABITAT

MAP SOURCE: USGS 7.5' CORONA SOUTH QUAD

Tierra Madre Consultants

Results

Project impacts

Evaluation of adverse biological impacts was based on CalMat's Final Pit Plan. This plan indicates that surface disturbance will occur on almost the entire project site. The only areas where complete destruction of existing biological resources will not occur are the areas containing riparian vegetation, which are shown on Map 1.

The riparian area in the southeast corner of the site may be subject to impacts from an increase in sedimentation resulting from quarrying activities above it. Increased sedimentation can adversely affect or even destroy riparian vegetation.

The other riparian area, adjacent to Temescal Wash, lies in the area identified as the site of the proposed processing plant. It is unknown whether this plant will directly impact the riparian habitat.

Impacts resulting from quarrying on the remainder of the site will include the following:

1. Direct impacts to Stephens kangaroo rat and its habitat.

2. Destruction of California black-tailed gnatcatcher habitat. The number of nesting pairs of gnatcatchers on the site is not known. Considering that observations of this species were made on both the east and west sides of the property, and that much suitable habitat exists throughout, a significant population may be present.

3. Loss of over 300 acres of raptor foraging habitat. This will contribute to the cumulative reduction of such habitat in the region.

Mitigating measures

Disruption of riparian habitat on the project site may require stream alteration agreements from the California Department of Fish and Game and/or the U. S. Fish and Wildlife Service (Sections 1601-3 of the Fish and Game Code and Section 404 of the federal Clean Water Act, respectively). These agencies should be contacted before any construction or quarrying activities begin in these areas.

Because the riparian areas comprise the most important overall wildlife habitat on the project site, these areas should be preserved. With the possible exception of the proposed processing plant, it appears that CalMat is avoiding the riparian communities. Location of the processing plant should be carefully considered, and priority given to avoiding riparian vegetation. If feasible, construction and operation activities should remain at least 50 feet from riparian areas.

If disturbance or removal of riparian vegetation is unavoidable, it may be possible to mitigate by enhancement of the wetland communities in the pit. The existing pond and its willow riparian community and freshwater marsh could be enlarged by excavating the portion of the pit on Calmat property to the level of the pond. Following inundation the excavated portion will vegetate naturally with riparian vegetation. This process could be accelerated by the active planting of willows and mulefat. Further enhancement of this area is possible by removing invasive non-native plants such as tamarisk and giant reed. If the pond is enlarged, monitoring of emerging vegetation should occur on a regular basis in order to remove tamarisk and giant reed. Further riparian enhancement may be possible by providing a continuous source of water to the riparian drainage in the southeastern corner of the property. Additional water in this drainage would undoubtedly result in an increase in density of the willow scrub community. If it is infeasible to supply water to this drainage, a wildlife guzzler installed in this area would be of benefit to native animal species.

Stephens kangaroo rat habitat on the site could be avoided by redesigning CalMat's pit plan. Suitable SKR habitat is shown in Map 3, and is generally grassy flat areas, or slopes of less than 15%. Riverside County is currently in the process of adopting an interim SKR mitigation fee plan until a Habitat Conservation Plan (HCP) can be formulated. The County Planning Department should be contacted to determine how the interim plan may apply to CalMat's proposed quarry. The U. S. Fish and Wildlife Service should also be contacted, since the Stephens kangaroo rat has recently been approved for listing as a federally endangered species.

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Surface Mining Permit No. 168
Species Lists

Plants

ANGIOSPERMIAE: DICOTYLEDONEAE	DICOT FLOWERING PLANTS
Amaranthaceae	**Amaranth family**
**Amaranthus albus*	Tumbleweed
Anacardiaceae	**Sumac family**
Rhus laurina	Laurel sumac
Rhus trilobata	Squawbush
Schinus molle	Pepper tree
Asclepiaceae	**Milkweed family**
Sarcostemma cyanchoides	Climbing milkweed
Asteraceae	**Sunflower family**
Ambrosia psilostachya	Western ragweed
Artemisia californica	California sagebrush
Baccharis emoryi	Emory's baccharis
Baccharis glutinosa	Mulefat
Bebbia juncea	Sweetbush
Brickellia californica	California brickellbush
**Centaurea melitensis*	Star thistle
Chrysopsis villosa	Golden-aster
Conyza canadensis	Mare's tail
Corethrogyne filaginifolia	Common corethrogyne
Encelia farinosa	Brittlebush
Gnaphalium californicum	Ever-lasting
**Gnaphalium luteo-album*	Cudweed
Haplopappus palmeri	Palmer's goldenbush
Haplopappus venetus	Goldenbush
Helianthus annuus	Common sunflower
Helianthus gracilentis	Slender sunflower
Hemizonia kelloggii	Kellogg's tarweed
Heterotheca grandiflora	Telegraph weed
**Lactuca serriola*	Wild lettuce
Malacothrix saxatilis	Cliff malacothrix
Pluchea purpurascens	Marsh fleabane
Stephanomeria virgata	Tall stephanomeria
**Xanthium strumarium*	Eastern cocklebur
Boraginaceae	**Borage family**
Amsinckia intermedia	Common fiddleneck
Heliotropium curassavicum	Heliotrope

Brassicaceae	**Mustard family**
*Brassica geniculata	Short-pod mustard
*Sisymbrium irio	London rocket
Cactaceae	**Cactus family**
Opuntia littoralis	Prickly pear
Opuntia parryi	Valley cholla
Chenopodiaceae	**Goosefoot family**
*Chenopodium ambrosioides	Mexican-tea
*Salsola iberica	Russian thistle
Euphorbiaceae	**Spurge family**
Croton californicus	California croton
Eremocarpus setigerus	Doveweed
Euphorbia polycarpa	Sand mat
*Ricinus communis	Castor bean
Geraniaceae	**Geranium family**
*Erodium cicutarium	Red-stem filaree
Lamiaceae	**Mint family**
*Marrubium vulgare	Horehound
Salvia apiana	White sage
Salvia mellifera	Black sage
Salvia columbariae	Chia
Malvaceae	**Mallow family**
Malacothamnus fasciculatus	Bush mallow
Polygonaceae	**Buckwheat family**
Eriogonum fasciculatum	California buckwheat
Eriogonum gracile	Slender woolly buckwheat
Polygonum hydropiperoides	Water smartweed
*Rumex crispus	Curly dock
Salicaceae	**Willow family**
Populus fremontii	Fremont's cottonwood
Salix gooddingii	Black willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
Scrophulariaceae	**Figwort family**
Mimulus puniceus	Coast monkeyflower
Solanaceae	**Nightshade family**
Datura meteloides	Jimsonweed
Lycium andersonii	Waterjacket
*Nicotiana glauca	Tree tobacco
*Solanum elaeagnifolium	Silverleaf horse-nettle
Solanum xanti	Purple nightshade

Tamaricaceae	**Tamarisk family**
*<u>Tamarix</u> sp.	Tamarisk
Urticaceae	**Nettle family**
<u>Urtica holosericea</u>	Stinging nettle

ANGIOSPERMIAE: MONOCOTYLEDONES	MONOCOT FLOWERING PLANTS
Araceae	**Palm family**
*<u>Washingtonia</u> sp.	Fan palm
Cyperaceae	**Sedge family**
<u>Cyperus odoratus</u>	Fragrant flatsedge
Poaceae	**Grass family**
*<u>Avena barbata</u>	Slender wild oats
*<u>Bromus diandrus</u>	Ripgut grass
*<u>Bromus mollis</u>	Soft chess
*<u>Bromus rubens</u>	Red brome
<u>Festuca megalura</u>	Foxtail fescue
*<u>Schismus barbatus</u>	Abu-mashi
Typhaceae	**Cattail family**
<u>Typha domingensis</u>	Tule cattail

* - denotes introduced (non-native) species
Nomenclature follows Munz (1974).

This list reports only those plant species actually observed on the site by this study. Other plants may have been overlooked or undetectable due to the seasonal nature of their occurrence.

Animals

AMPHIBIA	AMPHIBIANS
Hylidae	**Treefrogs**
Hyla regilla	Pacific treefrog
Ranidae	**True frogs**
Rana catesbeiana	Bullfrog
REPTILIA	REPTILES
Iguanidae	**Iguanids**
Sceloporus orcutti	Granite spiny lizard
Sceloporus occidentalis	Western fence lizard
Uta stansburiana	Side-blotched lizard
Teiidae	**Whiptails**
Cnemidophorus tigris	Western whiptail
AVES	BIRDS
Areidae	**Herons**
Nycticorax nycticorax	Black-crowned night-heron
Cathartidae	**Vultures**
Cathartes aura	Turkey vulture
Accipitridae	**Hawks, eagles, harriers**
Buteo jamaicensis	Red-tailed hawk
Aquila chrysaetos	Golden eagle
Falconidae	**Falcons**
Falco sparverius	American kestrel
Phasianidae	**Grouse and quail**
Callipepla californica	California quail
Scolopacidae	**Sandpipers**
Actitis macularia	Spotted sandpiper
Columbidae	**Pigeons and doves**
Columba livia	Rock dove
Zenaida macroura	Mourning dove
Cuculidae	**Cuckoos**
Geococcyx californianus	Greater roadrunner

Tytonidae	**Barn Owls**
Tyto alba	Common barn-owl
Apodidae	**Swifts**
Aeronautes saxatalis	White-throated swift
Trochilidae	**Hummingbirds**
Calypte anna	Anna's hummingbird
Picidae	**Woodpeckers**
Picoides nuttallii	Nuttall's woodpecker
Tyrannidae	**Tyrant flycatchers**
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
Tyrannus verticalis	Western kingbird
Alaudidae	**Larks**
Eremophila alpestris	Horned lark
Corvidae	**Crows and jays**
Aphelocoma coerulescens	Scrub jay
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Troglodytidae	**Wrens**
Salpinctes obsoletus	Rock wren
Thryomanes bewickii	Bewick's wren
Cistothorus palustris	Marsh wren
Muscicapidae	**Thrushes and allies**
Polioptila melanura	Black-tailed gnatcatcher
Mimidae	**Mockingbirds and thrashers**
Toxostoma redivivum	California thrasher
Laniidae	**Shrikes**
Lanius ludovicianus	Loggerhead shrike
Sturnidae	**Starlings**
Sturnus vulgaris	European starling
Emberizidae	**Sparrows, warblers, tanagers**
Vermivora celata	Orange-crowned warbler
Geothlypis trichas	Common yellowthroat
Wilsonia pusilla	Wilson's warbler
Pipilo erythrophthalmus	Rufous-sided towhee
Pipilo fuscus	Brown towhee
Amphispiza belli	Sage sparrow
Melospiza melodia	Song sparrow
Zonotrichia leucophyrs	White-crowned sparrow
Sturnella neglecta	Western meadowlark

Fringillidae	**Finches**
Carpodacus mexicanus	House finch
Carduelis psaltria	Lesser goldfinch
MAMMALIA	MAMMALS
Leporidae	**Hares and rabbits**
Lepus californicus	Black-tailed hare
Sylvilagus audubonii	Audubon cottontail
Sciuridae	**Squirrels**
Otospermophilus beecheyi	Beechey ground squirrel
Geomyidae	**Pocket gophers**
Thomomys bottae	Botta pocket gopher
Heteromyidae	**Pocket mice**
Dipodomys sp.	Kangaroo rat
Canidae	**Foxes, wolves and coyotes**
Canis latrans	Coyote
Procyonidae	**Raccoons**
Procyon lotor	Raccoon

Nomenclature follows Stebbins, *A Field Guide to Western Reptiles and Amphibians*, the American Ornithologists' Union, *Checklist of North American Birds*, sixth edition, and Ingles, *Mammals of the Pacific States*.

Appendix
5.9

Archaeology Report

CULTURAL AND PALEONTOLOGICAL
RESOURCES ASSESSMENT
CORONA QUARRY,
RIVERSIDE COUNTY, CALIFORNIA

for

FLORIAN MARTINEZ ASSOCIATES
15641 Red Hill Avenue
Tustin, California 29680-7383

by

SCIENTIFIC RESOURCE SURVEYS, INC.
5232 Bolsa Avenue, Suite 5
Huntington Beach, California 92649

September 19, 1988
SRS Job #851

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LIST OF FIGURES

INTRODUCTION

The following report is submitted by Scientific Resource Surveys, Inc. (SRS at the request of Florian Martinez Associates. The report presents the methods and results of an archaeological, historical, and paleontological assessment of an approximately 337 acre parcel of land known as the Corona Quarry. This investigation was conducted in compliance with the California Environmental Quality Act of 1970 which requires an Environmental Impact Assessment prior to approval of an application for a Surface Mining Permit.

LOCATION AND DESCRIPTION

The Corona Quarry is located in Riverside County, southeast of the City of Corona (Figure 1). Specifically the property is located near Temescal Wash east of Cajalco Street, approximately one mile south of Magnolia Street (Figure 2).

The general relief of the property ranges in elevation from under 800 feet in the flood plain of Temescal Wash, and rises abruptly to over 1600 feet in the hills east of the wash. The property is dissected by two major drainages and numerous smaller cuts and ravines, creating slopes of forty-five degrees and greater over fifty percent of the project area.

Riverine and open pit mining occurs on properties adjacent to the Corona Quarry site. Aggregates exposed on the property include quartzite, argillite, limestone, Temescal quartz latite porphyry, Corona hornblende granodiorite porphyry, Cajalco quartz monzonite, Home Gardens quartz monzonite porphyry, and Micropegmatite granite (CalMat 1988).

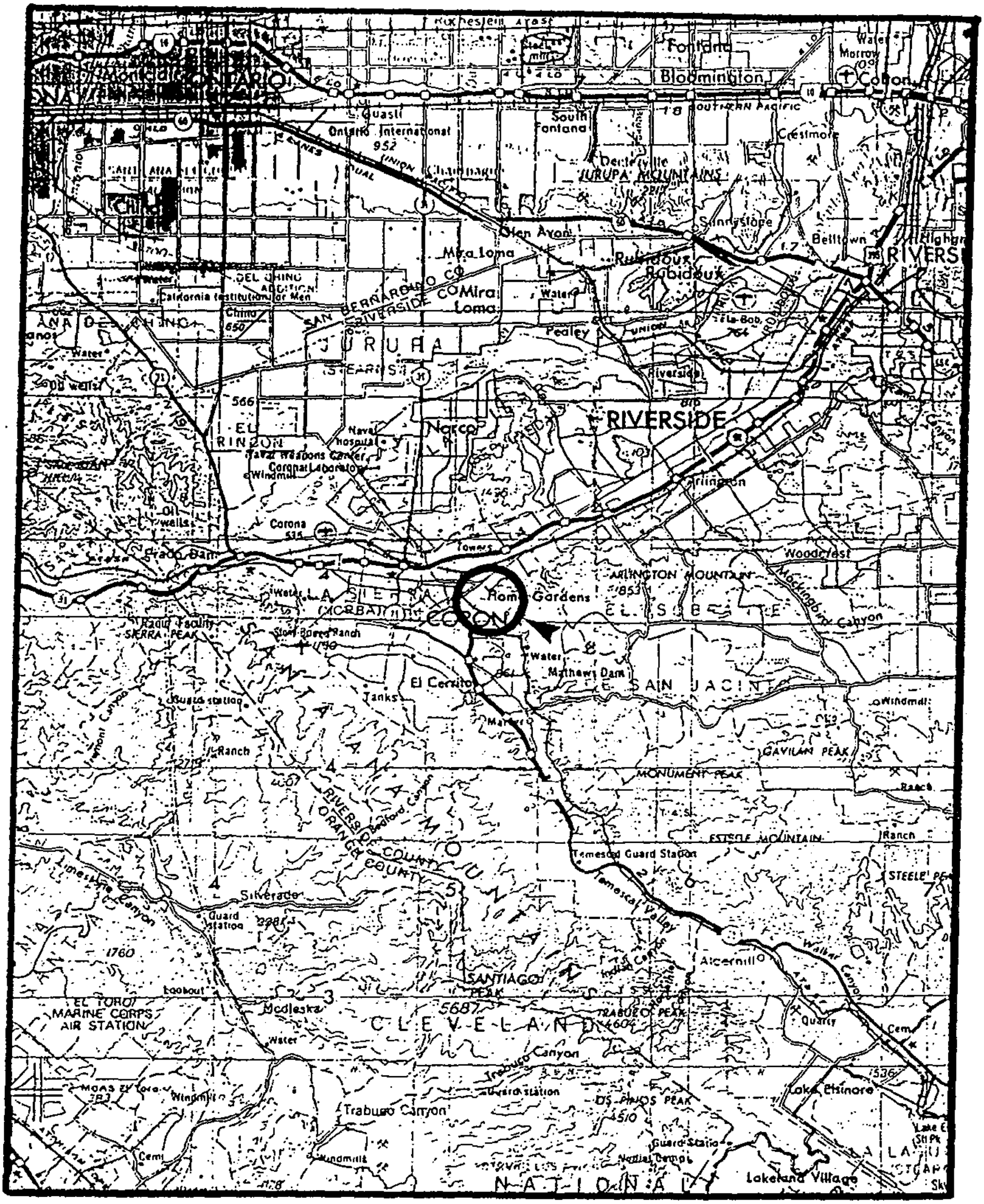

Figure 1. General Location of Corona Quarry. From USCS Santa Ana Quad.,(1979). Scale 1:250,000.

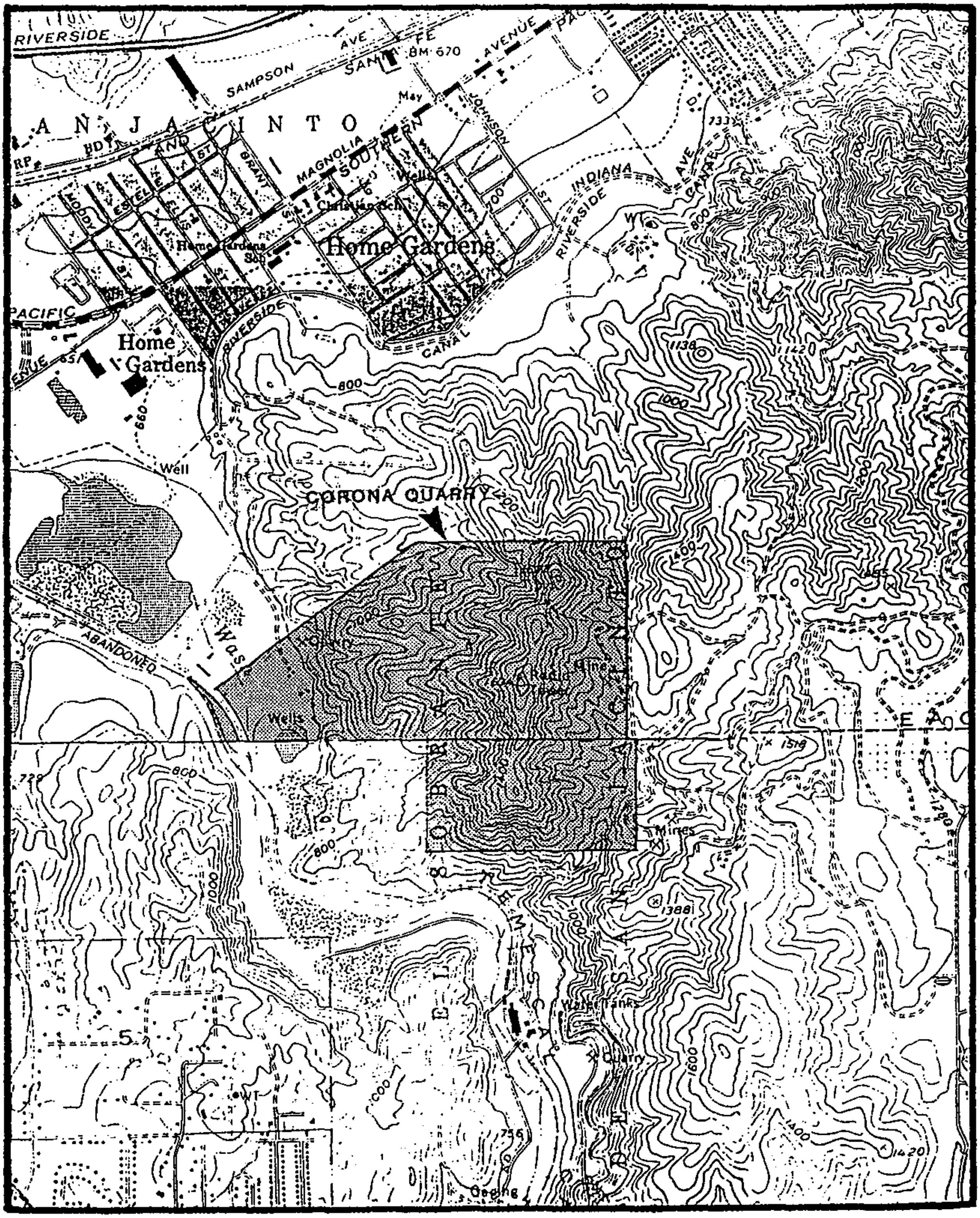

Figure 2. Specific Location of Corona Quarry. From USGS Corona South Quad., (1967; revised 1982). Scale 1:24,000.

METHODS

To identify cultural and paleontological resources on the subject property SRS utilized a three-phased approach. In the first phase, a records search was conducted for cultural resources previously documented on the project area. The records search was conducted at the California Archaeological Inventory, Eastern Information Center, University of California, Riverside (Appendix A).

The second phase consisted of an examination of available literature concerning the general project area. For prehistory, this investigation focused on settlement and subsistence patterns of the prehistoric inhabitants of the region. These patterns were then compared to area soils, vegetation, and geology maps within the SRS map archives. This provided a basis for understanding site location trends, especially in relation to the environment/topographic context of the project area.

Historic investigations included a review of literature regarding the City of Corona. Historic USGS maps which show structures existing in the early part of this century were also examined.

For paleontology, a review of Riverside County geology was undertaken. This included review of the California Division of Mines and Geology geologic map of the Corona area (Rogers 1965).

Following the records and archival search, the third phase was initiated. This consisted of an on-foot investigation of the subject parcel. The field survey was conducted by SRS Staff Archaeologists Roderic and Deborah McLean. Mr. McLean has over ten years field experience in southern California archaeological investigations. Mrs. McLean has over four years of field experience in southern California archaeology.

The field crew conducted transects ranging between five and twenty meters intervals, depending on assessibility, through the drainages and valleys, existing on the property. Those portions of the parcel with slopes greater than 45 degrees have low potential for possessing cultural remains. These areas were therefore not surveyed. Approximately fifty percent of the parcel exhibits slopes greater than 45 degrees.

RESULTS

GEOLOGY/PALEONTOLOGY

Three geologic units are exposed on the Corona Quarry property: 1) Jurassic-Triassic metavolcanics, 2) Mesozoic granodiorite, and 3) Recent alluvium.

Santiago Peak Volcanics (JTrv)

Lithologically, the Santiago Peak Volcanics may be described as predominantly dark-colored flows, tuffs, breccias, and agglomerates of largely andesitic composition (Rogers 1965). Due to their volcanic origin, there is no potential for paleontological localities to occur in exposures of the Santiago Peak Volcanics on the subject property.

Granodiorite (gr^{g})

The granodioritic exposures occurring east of Corona are described as dark-gray hornblende granodiorite porphyry (Rogers 1965). Because of their granitic nature, there is no potential for paleontological localities to occur in exposures of this geologic unit on the subject property.

Recent Alluvium (Qal)

The Recent Alluvium consists of unconsolidated stream, river channel, and alluvial fan deposits (Rogers 1965). This geologic unit has very low paleontological potential due to its mode of deposition. However, it is possible that isolated remains could be found in the Recent Alluvium during grading operations on the subject property.

PREHISTORY

The records search conducted at the Archaeological Research Unit of the University of California, Riverside indicated that the subject parcel had not been previously surveyed for cultural resources. No archaeological sites have been recorded on or within a one-mile radius of the property. The SRS field inspection did not locate any cultural resources during the two day survey.

HISTORY

Historically, the Corona area was part of the vast Mission San Gabriel lands, which stretched from San Gorgonio Pass to the east all the way to the Pacific Ocean on the west. After secularization of the missions in 1834, a portion of the San Gabriel Mission lands was sold to Juan Bandini in 1839. This included a 4500 acres parcel called Rancho Rincon which occupied the Santa Ana drainage east of the Chino Hills. Bandini sold the rancho to Bernardo Yorba in 1846 including the La Sierra Yorba parcel which included the location of the present city of Corona (Patterson 1971).

In 1886 a land boom hit Riverside County, and property values advanced sharply. Many new communities, including the City of South Riverside, now Corona, were established (Klotz 1969).

The first quarrying operations in the Corona area began in 1888. Temescal Wash has been the location of aggregate mining since the 1920s. Specifically, the 3M Company has operated quarry operations one mile south of the Corona Quarry site for the past forty-one years. A number of quarrying operations are currently active along Temescal Wash, mining dacite porphyry used for a variety of uses from industrial filler to roofing granules (CalMat 1988).

RECOMMENDATIONS

No cultural resources were discovered during the three-phased investigative research into the Corona Quarry site. The geologic units occurring on the subject property have no potential for yielding palentological specimens. No further evaluation or testing is recommended for the Corona Quarry property.

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CalMat

1988 A Plan for Reclamation: Corona Quarry. Copy on file with the County of Riverside.

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Patterson, T.

1971 A Colony for California. Press-Enterprise Company, Riverside, California.

Rogers, T.H.

1965 Geologic Map of California Santa Ana Sheet. California Division of Mines and Geology, Sacramento.

Case No.________________________
EA No.________________________
Date________________________

Report No.________________
STAFF USE ONLY
Reviewed by________________

ARCHAEOLOGICAL ASSESSMENT FORM

Riverside County Planning Department

PROPERTY OWNER L.S. Hawley Corp.; Pacific Industrial Properties; Bruce A. Hohn

ADDRESS ________________________ PHONE NO.________

APPLICANT Cal Mat Co.

ADDRESS 3200 San Fernando Rd.; Los Angeles, CA 90065 PHONE NO. 213 258-2777

MAP PREPARER Florian Martinez Associates

ADDRESS 15641 Red Hill Ave., #205; Tustin, CA 92680-7323 PHONE NO. 714 259-9300

CONSULTING ARCHAEOLOGIST Scientific Resource Surveys, Inc.

ADDRESS 5232 Bolsa Ave., Ste. 5; Huntington Beach, CA 92647 PHONE NO. 714-898-7877

This form is designed to provide additional information for the Initial Study process of environmental review. The form is divided into two parts. Part I is a set of questions and attachements for all projects when archaeological field reconnaissance is required. Part II is to be completed only when cultural resources have been located during the field reconnaissance. All answers and statements should be presented in a complete and concise manner.

PART I

A. QUESTIONS

1. Outline the methodology and scope of work done including field work.

An in-person records check was conducted at the Archaeological Research Unit at the Univ. of CA, Riverside. Also checked prior to the field work were the historic (1902) U.S.G.S. maps on file at S.R.S. The subject parcel (337 acres) was then physically surveyed by R. McLean and D. McLean on Sept. 9, 12, 13 and 14, 1988. This property consists of a prominent mountain range (1600 ft.) and several small valleys and drainages. These valleys and drainages were walked over in transects ranging from 5 to 20 meters in interval. At least 50 percent of the property exhibits steep 45 degree slopes. These areas were not surveyed because they do not involve the presence of cultural material.

2. What informants were consulted? Also provide the results of your records check.

No informants were consulted. All records checked at Univ. of CA, Riverside and at S.R.S. regarding the subject property were negative.

3. List the types of cultural resources observed.

No cultural resources were observed. No further mitigation measures for archaeology are necessary.

Nancy A. Whitney-Desautels

September 19, 1988

B. ATTACHMENTS REQUIRED FOR PART I AND II

1. A photocopy of the appropriate portion of the USGS quadrangle sheet delineating the following: (1) project boundaries; (2) approximate location of any recorded resources (including a specified UTM grid location); and (3) quad sheet title.
2. Photographs (color prints): including a panoramic view of the study area and details of any significant artifacts and features observed.
3. Drawings and other illustrations (when appropriate).
4. A list of all consulted references, highlighting those that relate specifically to the project area.

PART II

e mpleted when any cultural resources are recorded during archaeological reconnaissance for this project.

QU..TIONS

1. Identify the uses allowed by ordinance for this project that are most likely to pose direct and indirect adverse impacts to cultural resources: refer to Ordinance 348 (Land Use) and Ordinance 460 (Regulation of Subdivisions). Compare the potential uses and impacts with the specific development plans of the project sponsor. In the case of parcel maps and subdivisions, development plans refer to potential building sites and preliminary grading plans.

N/A

2. If the cultural resources observed and recorded, which are considered to be scientifically or culturally significant? Briefly explain the significance of each resource and outline your reasons for determining the degree of significance (include any references).

N/A

3. What is the opinion of the Native American Community concerning the significance of cultural resources and the potential impacts of this project? (Refer to the Planning Department's list of Native American Consultants.) Provide a brief summation and attach an independent assessment from the Native American Consultant (See Part II, B. ATTACHEMENTS, below).

N/A

4. What are the recommendations to the project sponsor for avoidance or mitigation of adverse impacts? Consider such mitigation measures as redesign, modification of grading plans, combination of lots, etc.

N/A

5. If further work (collection, mapping excavation, etc.) is recommended, what are the projected costs in terms of person-days?

N/A

ACHEMENTS REQUIRED

Native American Assessment (or documentation that an opinion was solicited but not received within a 30-day period).

2. Project exhibit map (tentative Parcel Map, Tract Map, Conditional Use Permit exhibit map, etc.) with detail sufficient to illustrate the approximate boundaries of all cultural resources recorded.

GEOLOGY/PALEONTOLOGY

Three geologic units are exposed on the Corona Quarry Property: 1) Jurassic-Triassic metavolcanics, 2) Mesozoic granodiorite, and 3) Recent alluvium.

GEOLOGIC UNITS

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Granodiorite (gr^g)

The granodioritic exposures occurring east of Corona are described as dark-gray hornblende granodiorite porphyry (Rogers 1965). Because of their granitic nature, there is no potential for paleontological localities to occur in exposures of the granodiorite on the subject property.

Recent Alluvium (Qal)

The Recent Alluvium consists of unconsolidated stream, river channel, and alluvial fan deposits (Rogers 1965). The unit has a very low paleontological potential do to its mode of deposition. However, it is possible that isolated remains could be found in this unit during grading operations.

REFERENCES CITED

Rogers, T.H.

1965 Geologic Map of California Santa Ana Sheet. California Division of Mines and Geology, Sacramento.

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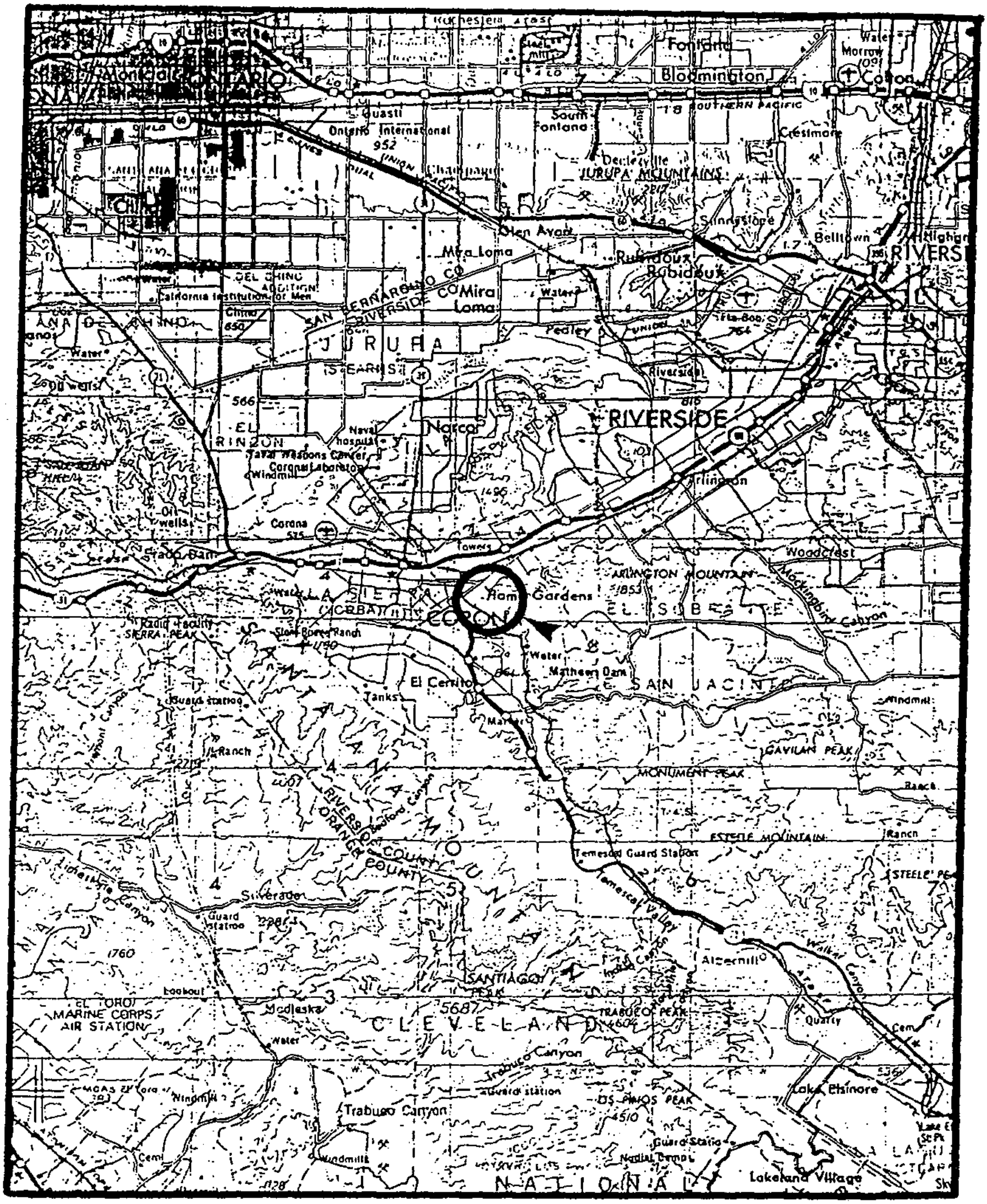


Figure 1. General Location of Corona Quarry. From USGS Santa Ana Quad.,(1979). Scale 1:250,000.

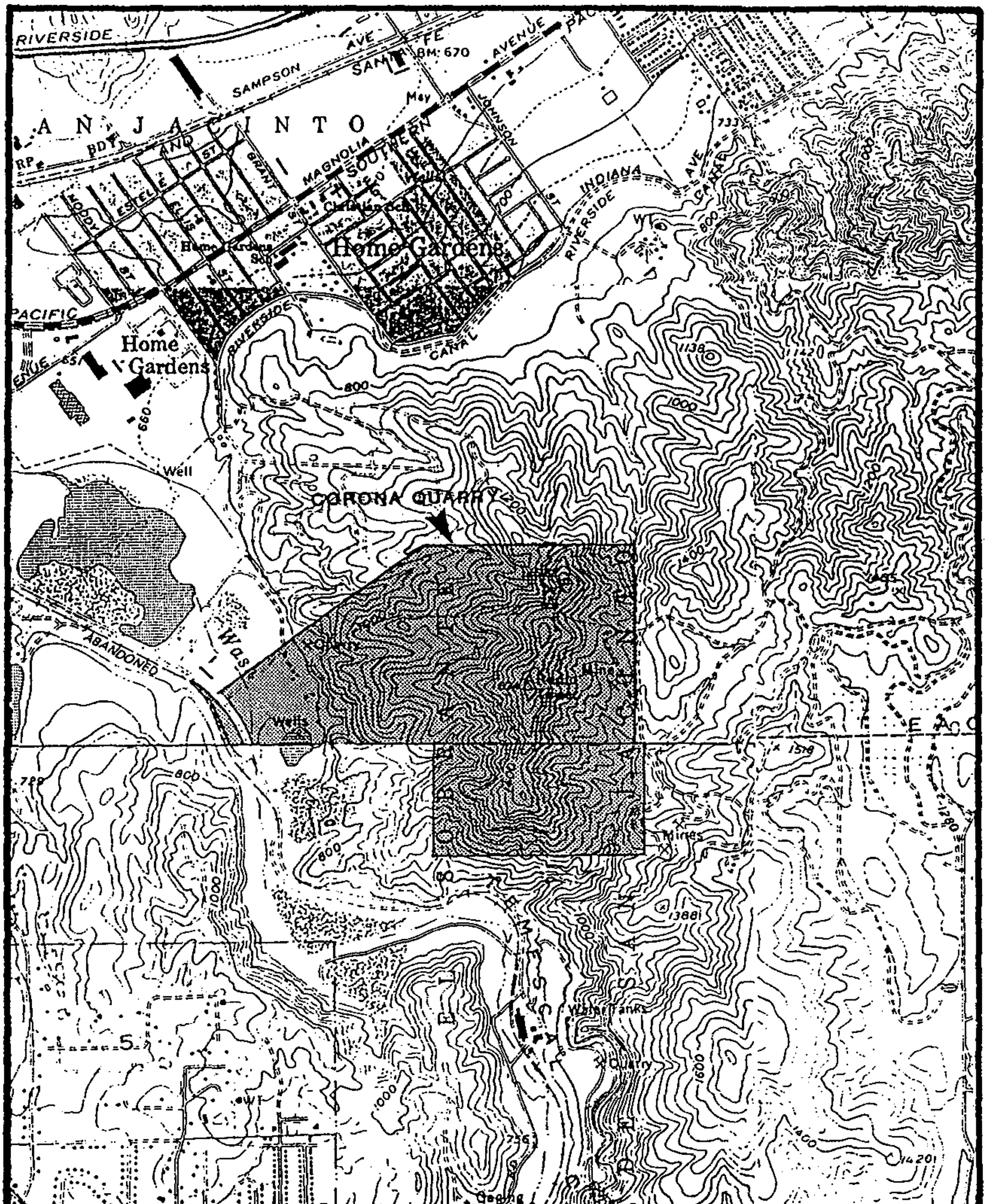
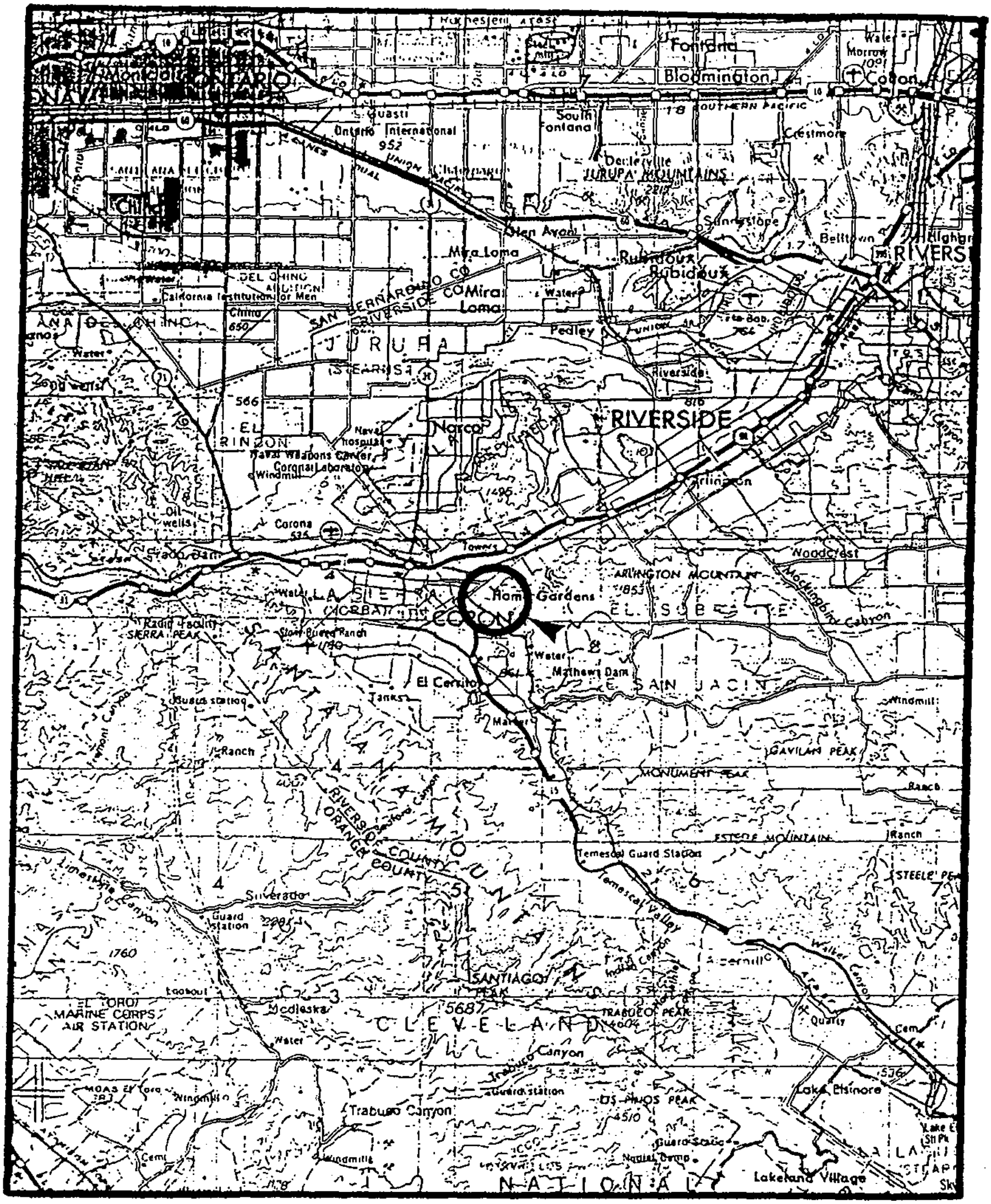


Figure 2. Specific Location of Corona Quarry. From USGS Corona South Quad.,(1967; revised 1982). Scale 1:24,000.



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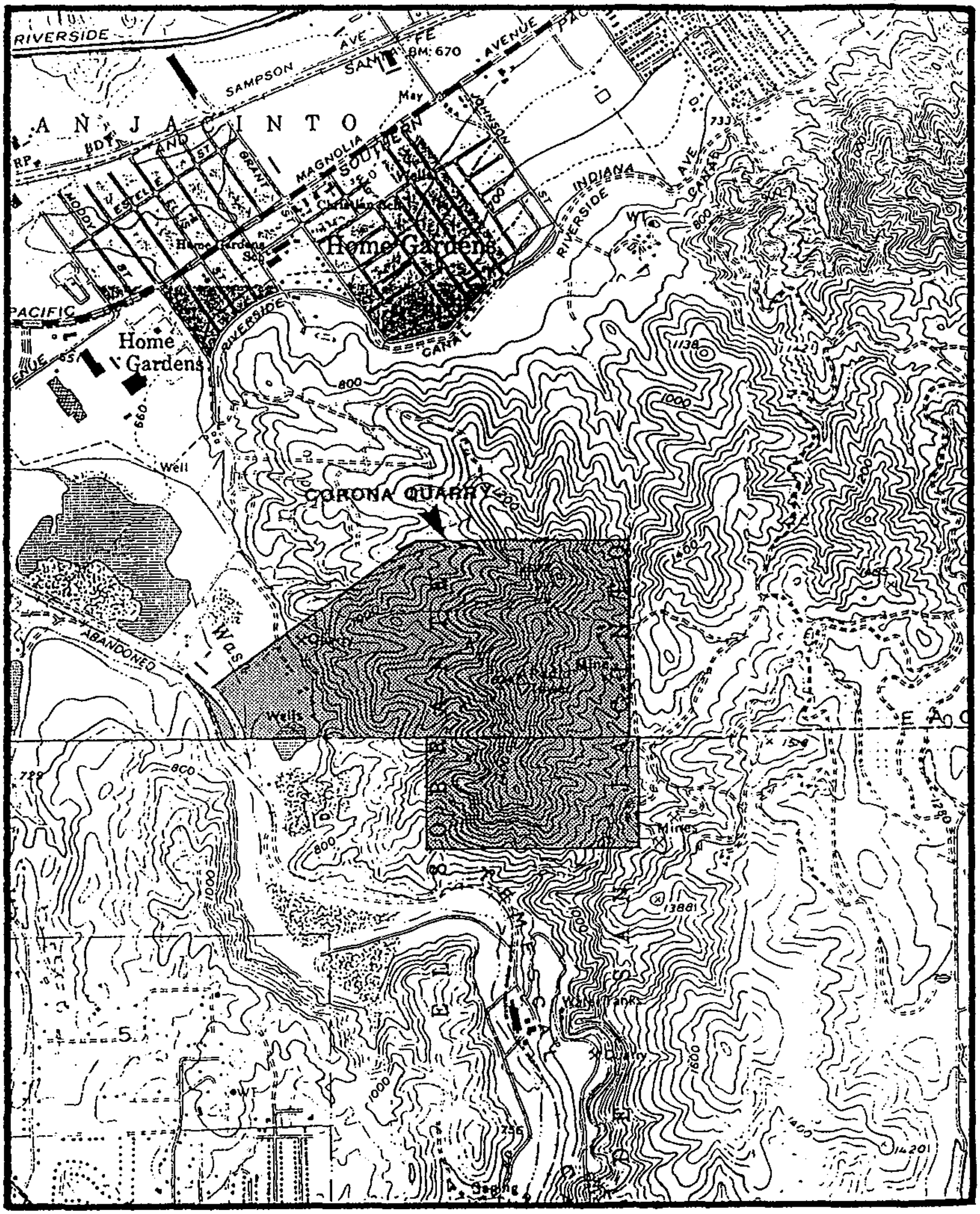

Figure 2. Specific Location of Corona Quarry. From USGS Corona South Quad.,(1967; revised 1982). Scale 1:24,000.

Appendix
5.10

Geological Slope Stability

ENGINEERING GEOLOGIC EVALUATION
PROPOSED SLOPES
CORONA QUARRY PROPERTY
T3S, R6W, SECTION 33, SBB&M
RIVERSIDE COUNTY, CALIFORNIA
FOR CALMAT
(OUR JOB NO. E-88211)

LeROY CRANDALL AND ASSOCIATES geotechnical consultants □ p.o. box 25088 □ 900 grand central ave. □ glendale, ca. 91201-3009
a subsidiary of Law Engineering facsimile (818) 246-4308 telephone (818) 243-4140

June 17, 1988

CalMat
P. O. Box 947
Colton, California 92324-0514

P. O. No. 375-15761
(Our Job No. E-88211)

Attention: Mr. Edward D. Elkins

Gentlemen:

Our report of "Engineering Geologic Evaluation, Proposed Slopes, Corona Quarry Property, T3S, R6W, Section 33, SBB&M, Riverside County, California, for CalMat" is herewith submitted.

The scope of the investigation was planned in collaboration with Mr. Edward D. Elkins, who advised us on the features of the proposed quarry excavation.

The site is underlain by very firm to hard and dense igneous bedrock. Based on our investigation of site conditions, the site is suitable, from an engineering geologic perspective, for the proposed quarry excavation. Analysis of the slope stability using the geologic structural data collected on-site indicate that the dominant joint sets within the bedrock would be grossly supported and that the proposed slopes should not be prone to major instabilities. The planned slopes should not result in instability to adjacent properties. Analysis of wedge failure potential indicates that there is some potential for unsupported wedges in south-facing slopes; however, the plunge of these wedges is low and failure of these wedges is not likely. Local instability of the interior slopes between individual benches and resultant rockfall should be anticipated; modification of interior slopes could be considered where encountered.

The results of our investigation are presented in the report. Please contact us if you have any questions, or if we can be of further service to you on this project.

Respectfully submitted,

LeROY CRANDALL AND ASSOCIATES

REGISTERED GEOLOGIST
MERVIN E. JOHNSON
NO. 26
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

by *Timothy P. Latiolait*
Timothy P. Latiolait, C.E.G. 1140
Project Engineering Geologist

by *Mervin E. Johnson*
Mervin E. Johnson, C.E.G. 26
Vice President
Director of Geological Services

YC28/dg
Attachments
(6 copies submitted)

ENGINEERING GEOLOGIC EVALUATION
PROPOSED SLOPES
CORONA QUARRY PROPERTY
T3S, R6W, SECTION 33, SBB&M
RIVERSIDE COUNTY, CALIFORNIA
FOR CALMAT

SCOPE

This report presents the results of our engineering geologic studies at the Corona Quarry property. The purpose of this report was to evaluate the potential slope stability of the proposed quarry excavation in order to minimize future geologic hazards. The location of the property and the proposed quarry excavation are shown on Plate 1, Geologic Map.

The scope of our services included a field reconnaissance of the property and surface geologic mapping of geologic structural features observed in outcrops on the site. Mapping was performed to develop information on the orientation, spacing, and physical characteristics of planar features, such as joints and shears, within the rock. Engineering geologic analysis of the structural data was performed to estimate the stability of the proposed rock slopes.

The professional opinions presented in this letter have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineering geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this letter.

SITE CONDITIONS

The site is located approximately three miles east-southeast of the City of Corona, in the mountains east of Temescal Wash. The property consists of about 300 acres. Elevations vary over the site from 700 to 1,634 feet above sea level. An existing quarry is present at the western boundary of the property, at the base of the mountains. The only existing structure on the site is a radio dish antenna and an associated blockhouse, which are located on the highest peak, at the center of the property.

The existing topography and the proposed quarry excavation are shown on Plate 1, Geologic Map. We understand that the ultimate excavation could create slopes up to 1,000 feet in height. The overall slope inclination is proposed to be approximately 45 degrees or 1:1 (horizontal to vertical). The slopes will be created by cutting benches 25 feet wide by 25 feet high. Local slope inclinations at individual benches are planned to vary from 75 to 90 degrees.

The base of the final excavation could be at an elevation of about 500 feet above sea level.

GEOLOGIC CONDITIONS

GENERAL

The site is located northeast of the Santa Ana Mountains, in the Peninsular Ranges geomorphic province. The Chino and Elsinore Faults are located approximately four miles southwest of the site. The property is underlain by intrusive igneous rocks of upper Jurassic and Cretaceous age. These rocks are generally porphyritic and are composed predominantly of quartz latite and granodiorite, with some quartz monzonite occurring locally. The geology of the site is shown on Plate 1. Subsurface geologic conditions are shown on Plate 2, Geologic Sections.

GEOLOGIC MATERIALS

The site is covered by a thin blanket of topsoil and slope wash deposits, which overlie igneous rocks.

Igneous Rocks

Crystalline igneous rocks on-site have been divided into four units by Gray (1961); the Home Gardens Quartz Monzonite Porphyry, the Caljalco Quartz Monzonite, the Corona Hornblende Granodiorite Porphyry, and the Temescal Wash Quartz Latite Porphyry.

Rocks of the Cretaceous age Home Gardens Quartz Monzonite Porphyry outcrop in a narrow band on the west side of the property. These rocks consist of light grey biotite quartz monzonite.

The Cajalco Quartz Monzonite outcrops in one area on the northern end of the property. This formation consists of pink to tan massive quartz monzonite and is Cretaceous in age.

The Corona Hornblende Granodiorite Porphyry occurs along the western and northern margin of the property and is exposed in the active quarry at the western boundary of the site. These rocks are dark grey and commonly porphyritic. The age of this unit is Jurassic to Cretaceous.

The Temescal Wash Quartz Latite Porphyry underlies the majority of the property. These rocks consist of blue-black to dark grey quartz latite to dacite and are commonly porphyritic. This unit is Jurassic in age.

Outcrops of the various rock types are present along ridges and hill tops and in stream gullies throughout the property. The outcrops exhibit prominent planar jointing, along which blocks separate. Occasionally, these blocks show partial rounding due to weathering. The majority of these outcrops, however, are very resistant, and are typically only slightly weathered. In contrast, road cuts in slope areas without natural outcrops expose bedrock which is weathered to a depth of four to five feet below ground surface.

STRUCTURAL FEATURES

The granitic rocks are cut by numerous joints which control the directions in which the rock breaks. The majority of the joints observed on the site are planar and are moderately continuous. The joints were most continuous in rock showing the greatest degree of weathering, and least continuous in resistant outcrops. Less than five percent of the joints observed have any filling material; a few joints in the quartz latite were filled with quartz. Spacing of the joints varied from about one inch to two feet, with an average spacing of four inches to one foot.

Only one apparent shear zone was observed on the site, in a road cut at Station 4. At that location, a north-dipping one inch thick gouge zone was observed surrounded by a two foot thick zone of sheared rock..

Mapping of the joints at various locations was undertaken in order to determine their dominant orientations and to evaluate the potential impact of these planes of weakness on the proposed quarry excavation. Joint orientations were collected at 19 localities (stations) throughout the site. The location of these stations is shown on Plate 1. The total number of orientations mapped is 209; these data are summarized in Table 1, Structural Data, presented in the Appendix to this report. Representative orientations are shown on Plates 1 and 2. Stereographic plots of the various discontinuities were used to analyze the data. These plots are presented on Plates 3.1 to 3.5. Details of our structural analysis are presented in the appendix.

In summary, three dominant jointing patterns (joint sets) were observed in the bedrock exposed on the property. Joint set #1 typically strikes between N15W and N25E and dips from 40 to 80° to the southeast.

Joint set #2 typically strikes from N5W to N35W and dips from 50 to 90° to the southwest. Joint set #3 strikes from N55E to N90E and dips from 70 to 90° to the northwest.

SLOPE STABILITY

The overall slope gradient of the proposed quarry excavation is planned at 1:1, or 45 degrees. This slope as proposed will be created by benches 25 feet wide at 25 foot height intervals. The slopes between the individual benches are proposed at angles of between 75 and 90 degrees. The base of the excavation is proposed to be at an elevation of approximately 500 feet above sea level. A south-facing slope up to 950 feet high would be created along the northern end of the excavation, while slopes up to 725 feet high would be present at the eastern and southern boundaries. A 175 foot high east-facing slope would be present on the western side of the site, adjacent to the deepest portion of the excavation.

CONCLUSIONS AND RECOMMENDATIONS

Based on our engineering geologic evaluation, the site is suitable, from a geologic perspective, for the proposed quarry excavation. Slope stability analysis of the structural data collected on-site indicates that the existing joint sets within the bedrock are generally steeper than the proposed overall slope gradient of 1:1 (45 degrees); therefore the proposed slopes should not be prone to major instabilities from most joint planes, since over 90 percent of these planes will continue to be supported after creation of the slopes. Consequently, from a gross stability standpoint, it is unlikely that the proposed quarry excavation would have significant adverse affects on the stability of adjacent properties.

Analysis of the wedge failure potential of the dominant joint sets indicates that most wedges are also supported with regard to the overall slope orientations. Locally, geometrically unsupported wedges in south-facing slopes would be present (Plate 3.3). However, the plunge of the joint intersection is low and the shape of the wedge is such that failure of this wedge is not likely with regard to the overall slope.

While gross stability of the overall slope configuration appears favorable, local instability at the steep slopes between individual benches should be anticipated, as the proposed cut slopes of the benches will be at angles of 75 to 90 degrees. These angles are equal to or steeper than the dip of the joint sets. These instabilities could locally render individual benches unsuitable for the support of quarry machinery and locally may constitute a safety hazard from rockfall. These problems should be more fully evaluated during the excavation operations, and modification of local slopes should be undertaken as needed.

A slope configuration that could help mitigate some of these localized problems would be 60 degree local slope angles with 15 foot wide benches. This would create an overall slope of about 40.5 degrees. If the bench width suggested by this configuration is sufficiently wide from an operational standpoint, comparatively little material loss would be realized and this could be recouped by deepening of the overall excavation.

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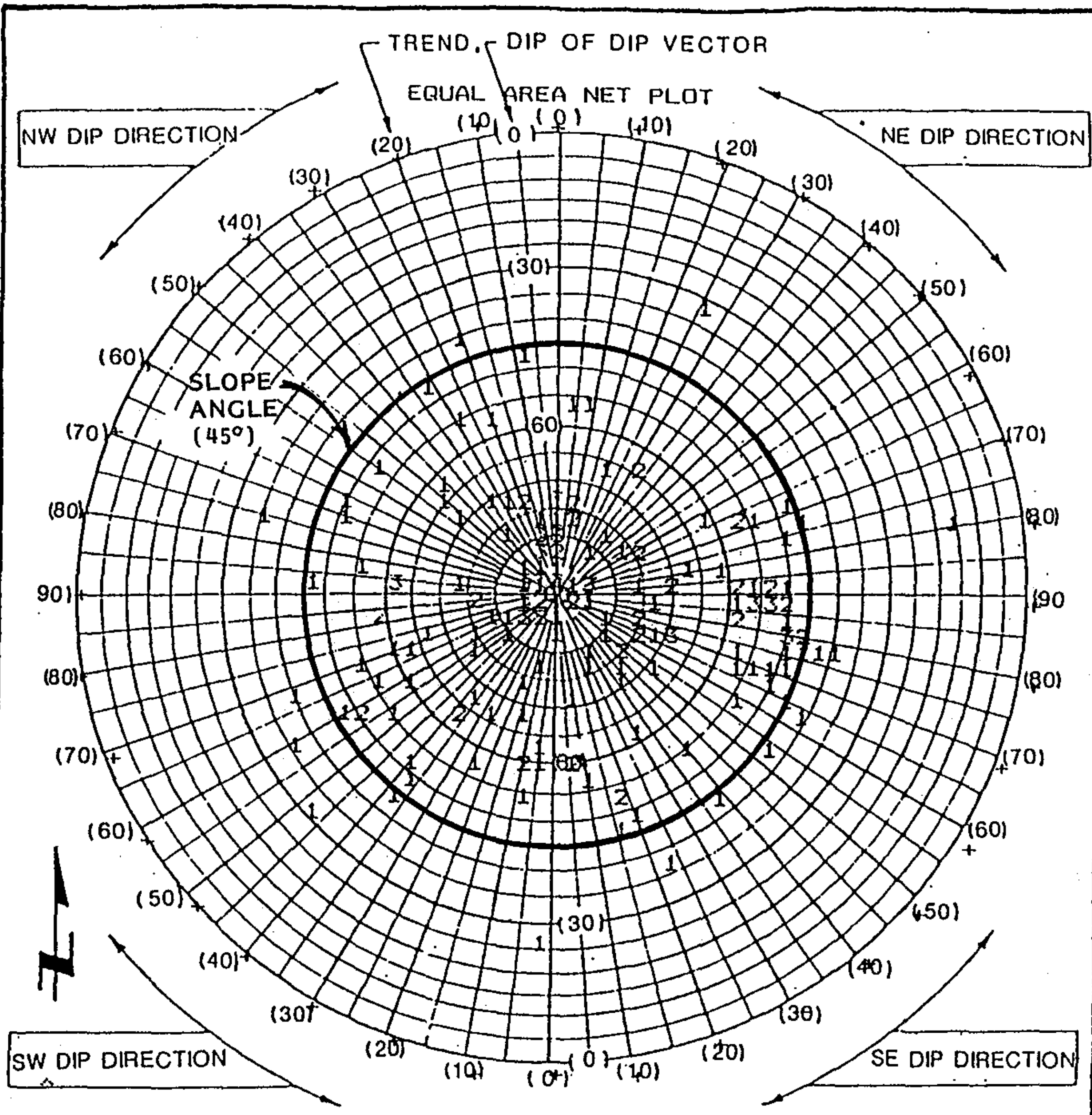


LOCATION

FILE(S): / calmat.DAT

OF STATIONS = 209

DIP VECTOR PLOT OF DISCONTINUITIES

GEOTECHNICAL DATA

LEGEND

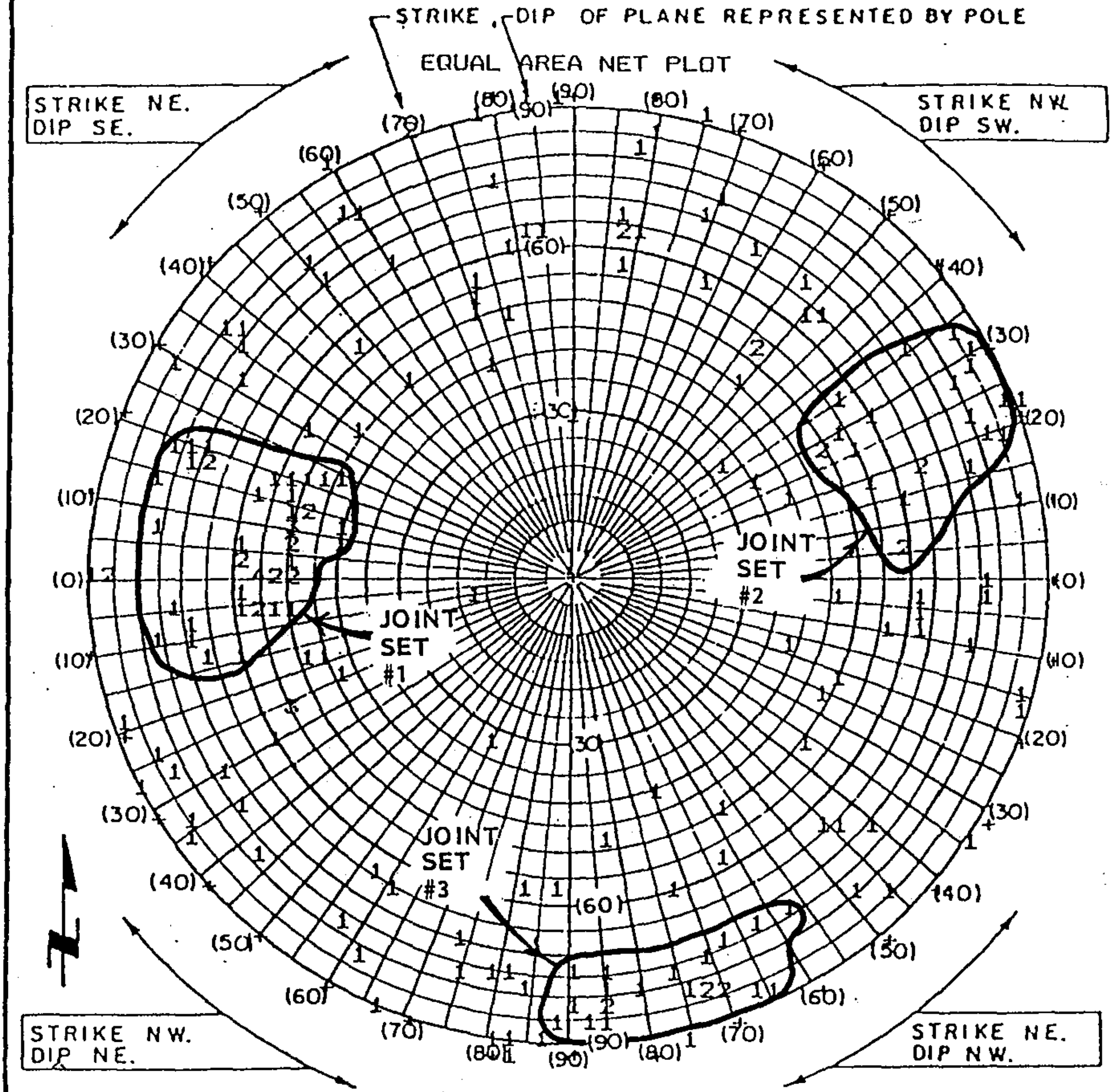
6 = NUMBER OF DISCONTINUITIES PLOTTING AT SAME LOCATION

DIP VECTOR DIAGRAM IN EQUAL AREA PROJECTION

LOWER HEMISPHERE

JOB E-88211

PLATE 3.1



LOCATION
FILE(S): / calmat.DAT
OF STATIONS = 209
POLE PLOT OF DISCONTINUITIES

LEGEND

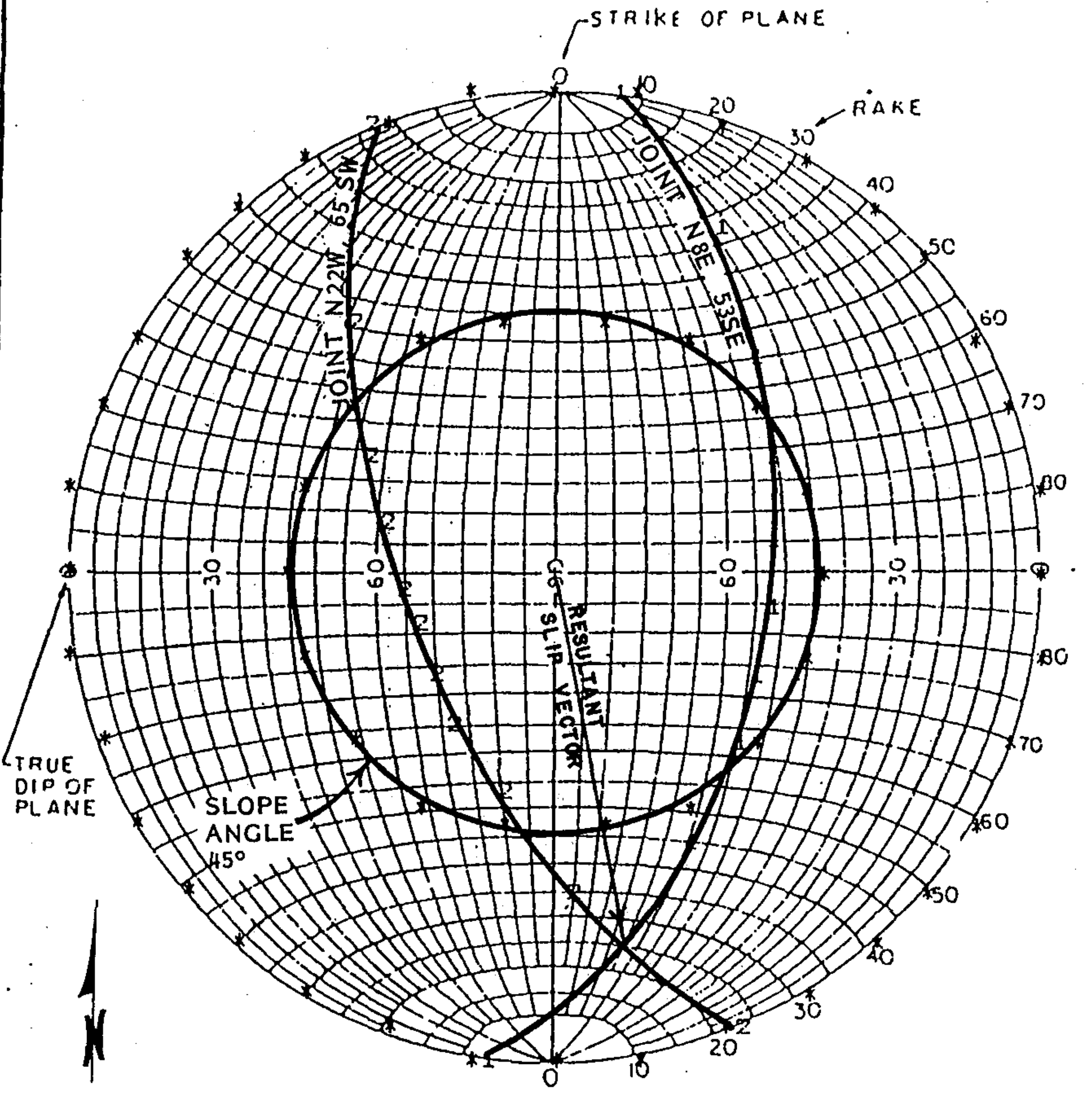
6 = NUMBER OF DISCONTINUITIES PLOTTING AT SAME LOCATION

GEOTECHNICAL DATA

POLE DIAGRAM IN EQUAL AREA PROJECTION
LOWER HEMISPHERE

JOB E-88211

PLATE 3.2



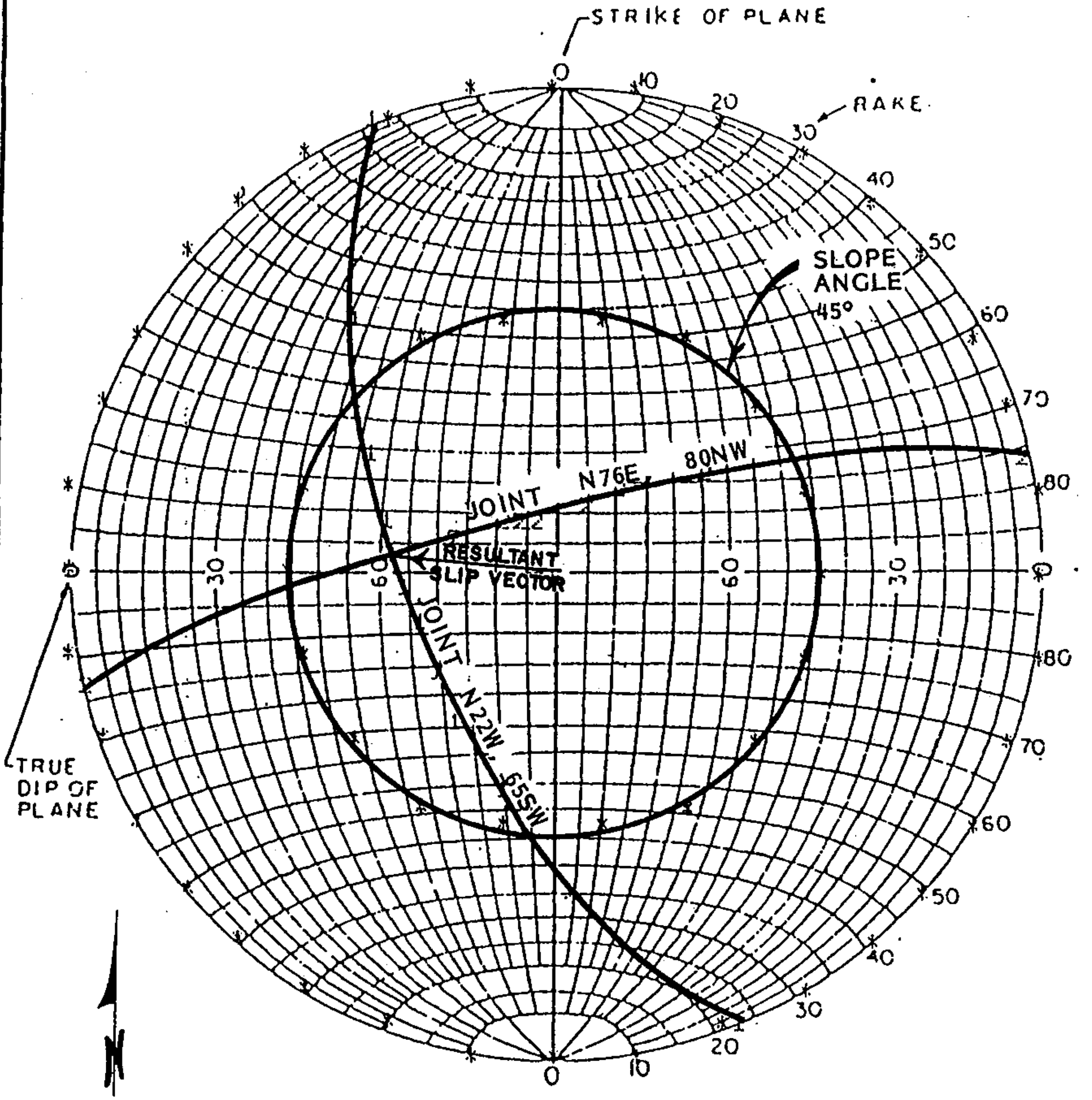
LEGEND

PHI= 45
1 DIP DIRECTION= 98 DIP= 53
2 DIP DIRECTION= 248 DIP= 65

GREAT CIRCLES IN EQUAL AREA PROJECTION
LOWER HEMISPHERE

JOB E-88211

PLATE 3.3



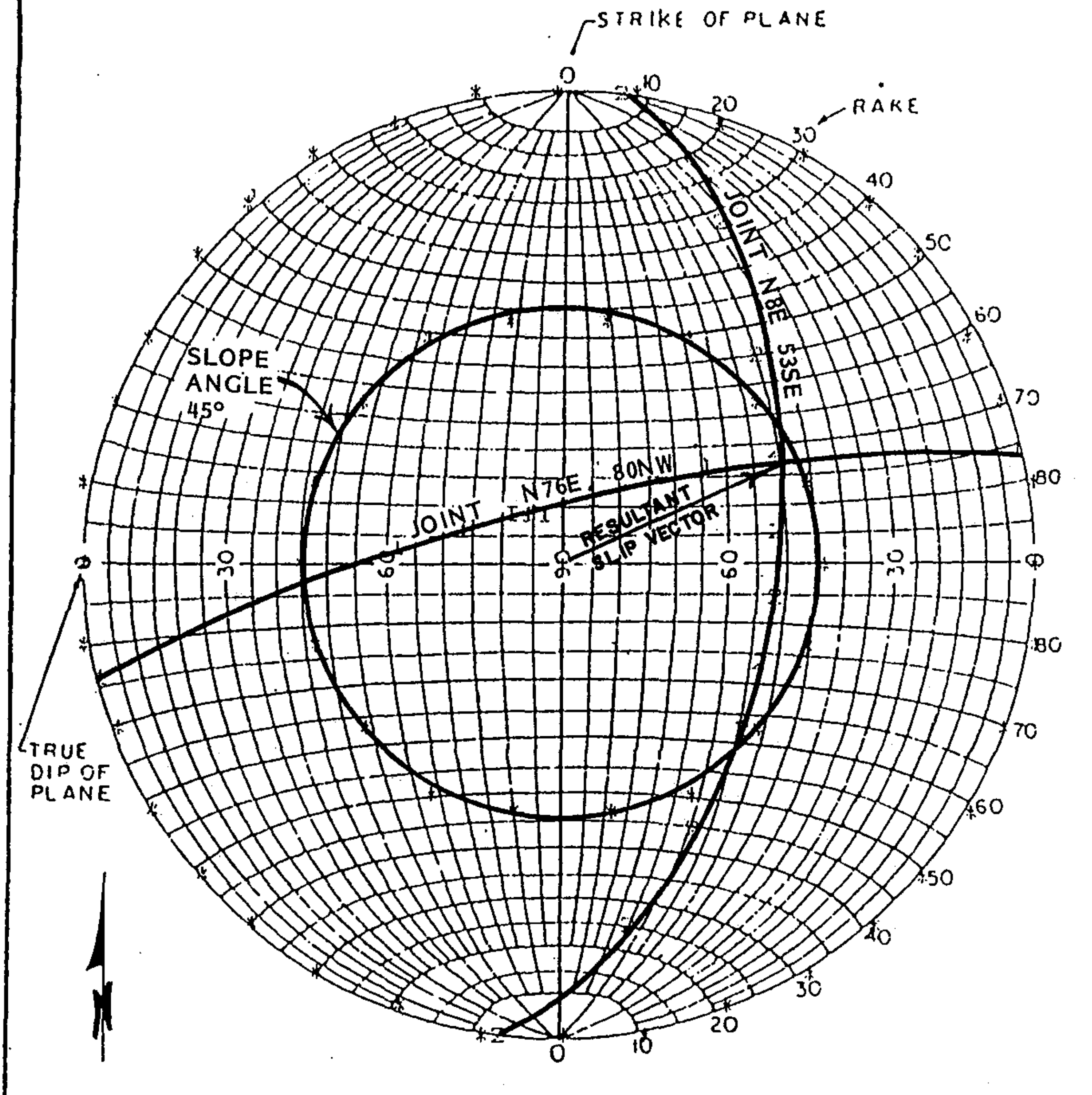
LEGEND

PHI= 45
1 DIP DIRECTION= 248 DIP= 65
2 DIP DIRECTION= 346 DIP= 80

GREAT CIRCLES IN EQUAL AREA PROJECTION
LOWER HEMISPHERE

JOB E-88211

PLATE 3.4



LEGEND

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PHI= 45
 1    DIP DIRECTION= 346 DIP= 80
 2    DIP DIRECTION= 98 DIP= 53
```

GREAT CIRCLES IN EQUAL AREA PROJECTION
LOWER HEMISPHERE

APPENDIX

STRUCTURAL ANALYSIS

Dip vector orientations of the 209 observed discontinuities (joints and shears) are plotted on Plate 3.1. Poles to the observed discontinuities are plotted on Plate 3.2. Representative joint orientations from the three dominant joint sets were then plotted as great circles on the lower hemisphere of an equal area net for stereographic analysis (Plates 3.3, 3.4, and 3.5). The purpose of these analyses was to evaluate the potential for both slope failure along joint planes and wedge failure along joint intersections that may impact the proposed quarry excavation.

Plate 3.1, Dip Vector Diagram in Equal Area Projection, Lower Hemisphere, shows a plot of the true dip vectors of the 209 observed discontinuities on a lower hemisphere stereographic plot. The slope angle of the proposed quarry excavation (45 degrees) was also plotted on the diagram. The diagram shows that 194 of the 209 vectors (93%) plot within the small circle which denotes the proposed slope angle. Since these vectors plunge at a steeper angle than the slope angle, they are supported; therefore, major failure of the proposed slopes along joint planes appears unlikely.

Plate 3.2, Pole Diagram in Equal Area Projection, Lower Hemisphere, depicts the poles (perpendiculars) to the 209 discontinuity planes that dip vectors are plotted for in Plate 3.1. The value of the pole plot here is that it allows for better definition of the prominent joint sets. The pole plot can also be used as a guide for vector direction that rock bolting would be oriented, if needed, since the poles are perpendicular to the planes they represent.

While the majority of the joint planes by observation and stereographic analysis of dip vectors appear to be supported, it is also necessary to consider the effects of intersecting planes. When two discontinuity planes intersect, there is potential for wedges to form. The line of intersection formed by the planes is equivalent to an apparent dip that is common to both planes. Since apparent dips by definition are always flatter than true dip, an evaluation of the vectors formed by these intersection lines (resultant slip vectors on Plates 3.3, 3.4, and 3.5) is necessary to determine that these flatter vectors are not unsupported in proposed slopes facing the same direction as the vector trends. In cases where they are unsupported, a potential for wedge failure exists.

Plates 3.3, 3.4, and 3.5, Great Circles in Equal Area Projection, Lower Hemisphere, show the potential wedge forming joint intersections (resultant slip vectors) between representative joints of the three prominent joint sets. The joint intersections in Plates 3.4 and 3.5 fall within the small circle of the proposed slope angle of 45 degrees, and are therefore supported. The joint intersection between the southwest-dipping and the southeast-dipping joint sets, shown on

Plate 3.3, plunges at about 24 degrees to the south. This vector plots outside of the small circle of the slope angle, and will be unsupported on south-facing slopes. However, the angle of plunge is sufficiently low and the wedge is elongate such that apparent shear strengths along the joint surfaces are not likely to be exceeded.

TABLE 1

	Data Point	Joint Orientation
Station 1:	1	N19E, 70SE
	2	N17E, 68SE
	3	N11W, 17NE
	4	N18E, 71SE
	5	N59E, 79SE
	6	N70E, 40NW
	7	N19E, 75SE
	8	N7E, 75SE
	9	N18E, 70SE
	10	N10E, 49SE
	11	N58E, 78SE
	12	N14E, 77SE
	13	N1E, 53SE
	14	N50E, 72SE
	15	N36E, 76SE
	16	N16E, 52SE
	17	N50E, 45SE
	18	N20E, 74SE
	19	N78E, 73SE
Station 2:	1	N82W, 56SW
	2	N24E, 43SE
	3	N65W, 58SW
	4	N14E, 57SE
	5	N71W, 70SW
	6	N83W, 65SW
	7	N13E, 46SE
	8	N84E, 90°
	9	N85W, 86NE
	10	N-S, 90°
	11	N22E, 48SE
	12	N14E, 49SE
	13	N79W, 62SW
Station 3:	1	N85E, 62SE
	2	N6W, 53NE
	3	N4W, 58NE
	4	N70E, 88SE
	5	N79E, 90°
	6	N88W, 27SW
	7	N69E, 90°
	8	N70E, 49SE
	9	N75E, 49SE
	10	N56W, 64NE

	Data Point	Joint Orientation
	11	N71E, 57NW
	12	N29W, 60NE
	13	N19W, 45NE
Station 4:	Shear Zone	N80W, 55NE
Station 5:	1	N80W, 83SW
	2	N81W, 80SW
	3	N18W, 49NE
	4	N23W, 45NE
	5	N25E, 53NW
	6	N3E, 46NW
	7	N89W, 78NE
	8	N82E, 61SE
	9	N70E, 73NW
	10	N80E, 59SE
	11	N1W, 86NE
	12	N22W, 40SW
	13	N18W, 54SW
	14	N67E, 39SE
	15	N48E, 76NW
	16	N13W, 60NE
Station 6:	1	N70E, 79NW
	2	N52W, 50SW
	3	N26W, 56NE
	4	N70W, 75SW
	5	N26W, 55NE
	6	N1W, 49NE
	7	N80E, 78NW
	8	N9W, 70NE
	9	N69E, 71NW
Station 7:	1	N39W, 32SW
	2	N83W, 62SW
	3	N81W, 62SW
	4	N86E, 83NW
	5	N10W, 76NE
	6	N5E, 49SE
	7	N32E, 70SE
	8	N60E, 64SE
Station 8:	1	N80W, 72NE
	2	N7W, 60NE
	3	N89W, 73NE
	4	N12W, 66NE

	Data Point	Joint Orientation
	5	N70E, 54SE
	6	N70E, 55SE
Station 9:	1	N34W, 73NE
	2	N64E, 86NW
	3	N50W, 45SW
	4	N60E, 90°
	5	N42W, 76NE
	6	N15E, 49SE
	7	N35W, 85NE
	8	N11E, 42SE
	9	N32W, 84NE
Station 10:	1	N1E, 85SE
	2	N72E, 80NW
	3	N64W, 30NE
	4	N-S, 52E
	5	N8W, 69NE
	6	N5E, 63NW
	7	N51E, 74SE
	8	N62E, 72NW
	9	N27W, 49SW
	10	N34W, 55SW
	11	N1E, 56SE
	12	N6E, 48SE
	13	N56W, 77NE
	14	N60W, 81NE
	15	N28W, 50SW
	16	N25W, 55SW
	17	N35E, 45SE
	18	N9E, 50SE
Station 11:	1	N34E, 88NW
	2	N60W, 64NE
	3	N6W, 59SW
	4	N48W, 64SW
	5	N35E, 75SE
	6	N30E, 55SE
	7	N1E, 75NW
	8	N4E, 62NW
	9	N30W, 60SW
	10	N65W, 90°
Station 12:	1	N75E, 78NW
	2	N85E, 75NW
	3	N29E, 82SE

	Data Point	Joint Orientation
	4	N36E, 80SE
	5	N17E, 87NW
	6	N7W, 58SW
	7	N5E, 60SE
Station 13:	1	N75E, 78NW
	2	N85E, 75NW
	3	N29E, 82SE
	4	N36E, 80SE
	5	N71E, 87NW
	6	N7W, 58SW
	7	N5E, 60SE
Station 14:	1	N10W, 83SW
	2	N19W, 84SW
	3	N62E, 56NW
	4	N85E, 80NW
	5	N59E, 48NW
	6	N46E, 82NW
	7	N22W, 79SW
	8	N32W, 84SW
Station 15:	1	N2E, 60SE
	2	N4E, 59SE
	3	N75W, 90°
	4	N81W, 88NE
	5	N82W, 90°
	6	N5W, 50NE
	7	N5W, 54NE
	8	N5W, 56NE
	9	N80W, 88NE
	10	N89E, 90°
	11	N-S, 55E
	12	N1W, 54NE
	13	N-S, 56E
	14	N27W, 90°
	15	N87W, 81NE
	16	N1W, 50NE
Station 16:	1	N9E, 51SE
	2	N21E, 51SE
	3	N19E, 56SE
	4	N19W, 64SW
	5	N17W, 66SW
	6	N28W, 80SW
	7	N84E, 47NW

	Data Point	Joint Orientation
	8	N86W, 56NE
	9	N6E, 48SE
	10	N17W, 74SW
	11	N20E, 54SE
	12	N10E, 40SE
Station 17:	1	N27W, 83NE
	2	N23W, 86SW
	3	N75E, 84NW
	4	N30W, 74NE
	5	N66E, 83NW
	6	N71E, 81NW
	7	N19W, 82SW
	8	N28W, 85SW
	9	N19W, 87NE
	10	N22W, 85NE
	11	N76E, 76NW
Station 18:	1	N34W, 74SW
	2	N4W, 72NE
	3	N56E, 70NW
	4	N79W, 72NE
	5	N15W, 61SW
	6	N46E, 56SE
	7	N10E, 73NW
	8	N10E, 56NW
	9	N7E, 63NW
	10	N72W, 67NE
	11	N75W, 76NE
Station 19:	1	N39E, 69NW
	2	N51W, 67SW
	3	N60W, 68SW
	4	N72E, 80NW
	5	N75E, 88NW
	6	N50W, 63SW
	7	N3E, 76NW
	8	N84W, 75NE
	9	N42E, 64NW
	10	N45E, 64NW
	11	N50W, 51SW
	12	N29W, 36SW
	13	N35E, 51NW
	14	N30W, 87SW
	15	N22W, 90°

Appendix
5.11

Traffic Report

Corona Quarry Traffic Study

Kunzman Associates

Transportation Planning • Traffic Engineering

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Corona Quarry

Traffic Study

This report contains the traffic impact analysis for the CalMat Corona Aggregate Quarry in the County of Riverside. The project is located adjacent to the City of Corona, east of the I-15 Freeway and south of Magnolia Avenue. The project consists of the expansion of an existing 10 acre aggregate quarry to a larger 337 acre site. The expanded quarry site will produce large volumes of processed construction aggregates including dry aggregates, asphaltic concrete, and ready-mix concrete. The quarry operation is projected to exist over a period of approximately 50 to 75 years.

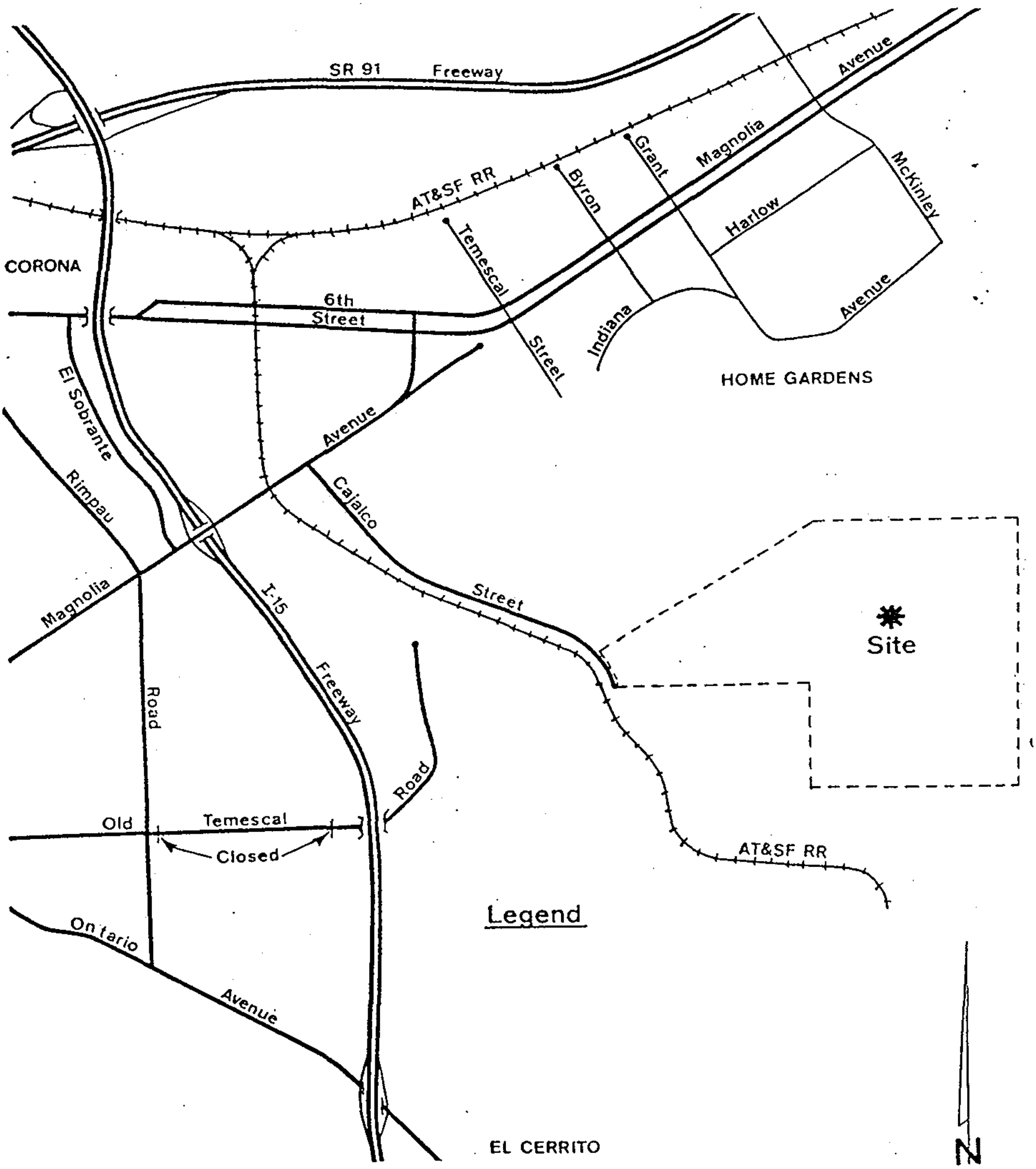
The location of the site is shown in Figure 1.

The traffic report contains documentation of existing traffic conditions, traffic generated by the project, distribution of the project traffic to roads outside the project, and an analysis of future traffic conditions. Each of these topics is contained in a separate section of the report. The first section is "Findings", and subsequent sections expand upon the findings. In this way, information on any particular aspect of the study can be easily located by the reader.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided in Appendix A.

Figure 1

Location Map



Kunzman Associates

1. Findings

This section summarizes the existing traffic conditions, project traffic impacts, and the proposed mitigation measures.

Existing Traffic Conditions

a. The project site is occupied at present by an existing 10 acre quarry operation.

b. The project site currently takes access exclusively from Cajalco Street, and will continue to do so for future operations.

c. Cajalco Street also serves as an access roadway to the existing Fontana Paving aggregate quarry to the south of the project site.

d. Magnolia Avenue in the vicinity of Cajalco Street exists as an unimproved 2-lane roadway. Magnolia Avenue at the I-15 Freeway, and Magnolia Avenue at Sixth Street have been improved to a 4-lane divided roadway.

e. Magnolia Avenue in the vicinity of Cajalco Street, along the 2-lane segment, is currently operating near it's design capacity.

f. The intersections of Magnolia Avenue and the I-15 Freeway Ramps, and the intersection of Magnolia Avenue/Cajalco Street are all currently operating at Level of Service B or better during both the morning and evening peak traffic hours.

Traffic Impacts

a. The proposed use for the site is a 337 acre aggregate quarry which will produce both dry construction aggregates and enhanced aggregate products.

b. The project will operate in two phases. The initial phase will occur over approximately the first 10 to 15 years, will utilize a smaller, portable processing plant, and will produce aggregates at a maximum rate lower than during the secondary phase. The secondary phase will mark the installation of a permanent processing plant and will produce up to 5,000,000 tons of aggregates per year, or approximately 16,025 tons per day for the remaining years of project operation.

c. At full site development, expected to occur 15 to 20 years from project startup, the project will generate 1,750 daily vehicle trips, 270 of which will occur during the morning peak hour and 50 of which will occur during the evening peak hour.

d. For existing plus project traffic conditions at full site development, the 2-lane segment of Magnolia Avenue west of Cajalco Street will exceed it's existing design capacity. This roadway segment will require improvement to a 4-lane divided cross-section to match the existing cross-section easterly and westerly of Cajalco Street.

e. For existing plus project traffic conditions at full site development, all intersections in the vicinity of the project will operate at Level of Service D or better without roadway improvements.

f. For existing plus project traffic conditions at full site development, a traffic signal will not be warranted at the intersection of Magnolia Avenue/Cajalco Street.

g. Cajalco Street will be adequate as a 2-lane roadway under all conditions.

Mitigation Measures

a. Improve the existing 2-lane segment of Magnolia Avenue in the vicinity of Cajalco Street to a 4-lane divided cross-section. This improvement will be required when the yearly plant production exceeds approximately 2,350,000 tons of aggregate per year.

b. Maintain adequate sight distance at the intersection of Magnolia Avenue and Cajalco Street.

c. Although a traffic signal is not warranted at the intersection of Magnolia Avenue and Cajalco Street based on volumes, other conditions may warrant the installation of a signal at this location in the future. The operation of this intersection should be reviewed periodically to determine if there is a need for a signal.

d. Maintain a high level of service along Magnolia Avenue by restricting parking and controlling roadway access.

2. Project Description

This section discusses the project's location, proposed development, and traffic characteristics of such a development.

Location

The project site is located in the unincorporated portion of Riverside County, southeast of and adjacent to the City of Corona. The site is south of Magnolia Avenue and east of the I-15 Freeway. The site is currently in use as a small aggregate quarry and similar activities are also in progress on adjacent land parcels.

Proposed Development

The project consists of the expansion of an existing 10-acre aggregate quarry to a larger 337-acre site. The expanded quarry site will produce large volumes of processed construction aggregates including graded dry aggregates, asphaltic concrete, and ready-mix concrete. The life of the mining operation is expected to extend into the mid-21st century.

Expansion of the site will take place in two phases. During the initial phase which will occur over approximately the first 10 to 15 years, rock from the site will be processed in amounts ranging from 300,000 tons to 5,000,000 tons per year utilizing a portable processing plant. At the end of this period, a permanent plant will be installed to handle production for the remainder of the mining period. During this period, the average production will be on the order of 5,000,000 tons per year.

A variety of truck types will be used to deliver finished products from the site. These include:

Double-trailer bottom-dump - 64 feet in length with a capacity of 26.5 tons and a maximum gross weight of 40 tons, used to haul loose aggregates.

Semi rear-dump - 50 feet in length with a capacity of 20.15 tons and a maximum gross weight of 36.75 tons, used to haul loose aggregate and rip-rap.

Single-unit 10-wheel dump - 26 feet in length with a capacity of 14.5 tons and a maximum gross weight of 26 tons, used to haul loose aggregate and asphalt.

Single trailer - 61 feet in length with a capacity of 25 tons and a maximum gross weight of 40 tons, used to haul loose aggregate and asphalt.

Ready-mix transit - 40 feet in length with a capacity of 10 cubic yards and a maximum gross weight of 33 tons, used to haul ready-mix concrete.

The following describes the proposed land use from a traffic engineering viewpoint:

Aggregate Quarry: Heavy trucks make up the majority of traffic from this type of facility, with other light vehicles representing employees traveling to and from work. Hours of plant operation and product delivery typically begin prior to the morning peak traffic hour and end before the evening peak traffic hour in support of off-site construction activities.

3. Existing Traffic Conditions

The traffic conditions as they exist today are discussed below and illustrated in Figures 2 and 3.

Surrounding Street System

Roadways that will be utilized by the development include Magnolia Avenue, Cajalco Street, Interstate 15, and State Route 91.

Magnolia Avenue: Magnolia Avenue is predominantly a 4-lane divided roadway extending northeasterly from Corona to Riverside. A short section of the roadway in the vicinity of Cajalco Street exists as an unimproved 2-lane cross-section. In the vicinity of the project, Magnolia Avenue is currently carrying approximately 11,200 vehicles per day.

Cajalco Street: This roadway tees with Magnolia Avenue easterly of the I-15 Freeway and provides the exclusive access to the project site. The roadway exists as a paved 2-lane cross-section near Magnolia Avenue and carries mostly heavy trucks to industrial sites. Existing daily volumes on this roadway are estimated to be approximately 900 vehicles per day.

Existing Travel Lanes and Intersection Controls

Figure 2 identifies the existing roadway conditions for arterials near the site. The number of through lanes for existing roadways and the existing intersection controls are identified.

Daily Traffic Volumes

Figure 3 depicts the average daily two-way traffic volumes. Traffic volumes were obtained from the report Magnolia Marketplace Traffic Study, February 1988, by Kunzman Associates. and the 1986 Traffic Volumes on State Highways from CalTrans.

Existing Daily Volume to Capacity Ratios

Roadway capacity is generally defined as the number of vehicles which can be reasonably expected to pass over a given section of road in a given time period. Congestion, high accident rates, the quality of traffic flow (Level of Service), and environmental acceptability all come into play in defining a particular roadway's effective capacity. It is possible to identify maximum desirable volumes for typical roadway types based on the number of roadway travel lanes. These daily volumes reflect estimates of the amount of daily traffic which will result in peak hour traffic volumes equal to the maximum desirable capacity of each roadway type. Table 1 contains roadway daily capacities for Level of Service C by roadway type.

By dividing existing daily traffic volumes by the daily roadway capacities listed above, existing daily volume to capacity ratios have been calculated and are shown in Figure 3. As may be seen in Figure 3, all existing roadways in the vicinity of the site are operating at Level of Service A, except for a portion of Magnolia Avenue east of the I-15 Freeway.

Existing Intersection Capacity Utilization

The technique used to assess the operation of an intersection is known as Intersection Capacity Utilization (ICU). To calculate an ICU the volume of traffic using the intersection is compared to the capacity of the intersection. ICU is usually expressed as a percent. The percent represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. The ICU's for existing intersections in the vicinity of the project are shown in Table 2. Existing ICU's are based upon manual peak hour turning movement counts made by Kunzman Associates in September, 1988. An explanation of ICU and Level of Service is included in Appendix B. All intersections in the vicinity of the site operate at a Level of Service B or have been increased by 10 percent to account for the effect of trucks in the traffic stream.

The ICU worksheets in Appendix B are an example of the calculations and technique used for each critical intersection. Not all intersections for which an ICU was calculated are included in Appendix B.

Comparison of daily volume to capacity ratios and corresponding Level of Service, and peak hour Intersection Capacity Utilization and corresponding Level of Service reveals significant differences. The differences between daily link volume to capacity ratios and peak hour Intersection Capacity Utilization is particularly pronounced when cross traffic is light. Daily volume to capacity ratios assume that all cross streets require 50 percent of the time to satisfy their demand, and assume that the subject street has 50 percent of the time available to it. The daily link volume to capacity ratios are a generalized indicator while peak hour Intersection Capacity Utilization actually represents what can be expected in the peak hour at intersections. Of the two indicators, the peak hour Intersection Capacity Utilization and corresponding Level of Service is by far the best measure of roadway performance.

Table 1

HIGHWAY CAPACITY FOR RIVERSIDE COUNTY
GENERAL PLAN ROADS

Facility	Number of Lanes	Design Capacity (1)	Maximum Capacity (2)	Peak Hour Volume (3)	
				Level C	Level E
Freeway	4	60,000	86,000	6,000	6,880
Freeway	6	96,000	138,000	9,600	11,040
Freeway	8	132,000	190,000	13,200	15,200
Freeway	10	168,000	240,000	16,800	19,200
Expressway	4	50,000	80,000	5,000	6,400
Expressway	6	78,000	120,000	7,800	9,600
Urban Art.	6	38,000	59,000	3,800	4,720
Arterial	4	24,000	38,000	2,400	3,040
Major	4	24,000	38,000	2,400	3,040
Secondary	4	20,000	30,000	2,000	2,400
Collect.(4)	2	12,000	18,000	1,200	1,400

(1) "Level of Service C" is used for analysis and evaluation, and is defined as a stable flow condition in which volume and density restrict the freedom to select speed, change lanes or pass. Values indicate Average Daily Traffic.

(2) "Level of Service E". This value reflects the absolute maximum volume under ideal conditions. This level of service is characterized by unstable flow, extremely high volumes and limited operating speed with intermittent vehicle queueing. Values indicate Average Daily Traffic.

(3) Peak Hour volume is assumed to be 10 percent for Level of Service C and 8 percent for Level of Service E, based on higher volumes spread over a longer time period.

(4) Capacities are for two-lane arterials; majors and secondaries will be similar when constructed as two lanes.

NOTE: All capacities are based on improvement to full County standards under optimum operating conditions. Capacity can be significantly reduced by a higher incidence of pedestrian traffic or turning movements. Substandard vertical and horizontal alignment, or any condition which might restrict sight distance will also reduce capacity.

Source: Riverside County Road Department

Table 2

EXISTING INTERSECTION CAPACITY UTILIZATION
AND LANE GEOMETRICS

Intersection	Intersection Approach Lanes (1)												Peak Hour ICU (2)	
	Northbound			Southbound			Eastbound			Westbound				
	T	R	L	T	R	L	T	R	L	T	R	L	AM	PM
Magnolia Avenue (EW)														
I-15 SB Ramps (NS)	0	0	0	1	1	0	0	2	1	1	2	0	38	60
I-15 NB Ramps (NS)	1	1	0	0	0	0	1	2	0	0	2	1	54	59
Cajalco Street (NS)	0	1	0	0	0	0	0	1	0	1	1	0	66	56

(1) When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

(2) Intersection Capacity Utilization (ICU)

T = Through
R = Right
L = Left

Figure 2

Existing Number of Through Travel Lanes and Intersection Controls

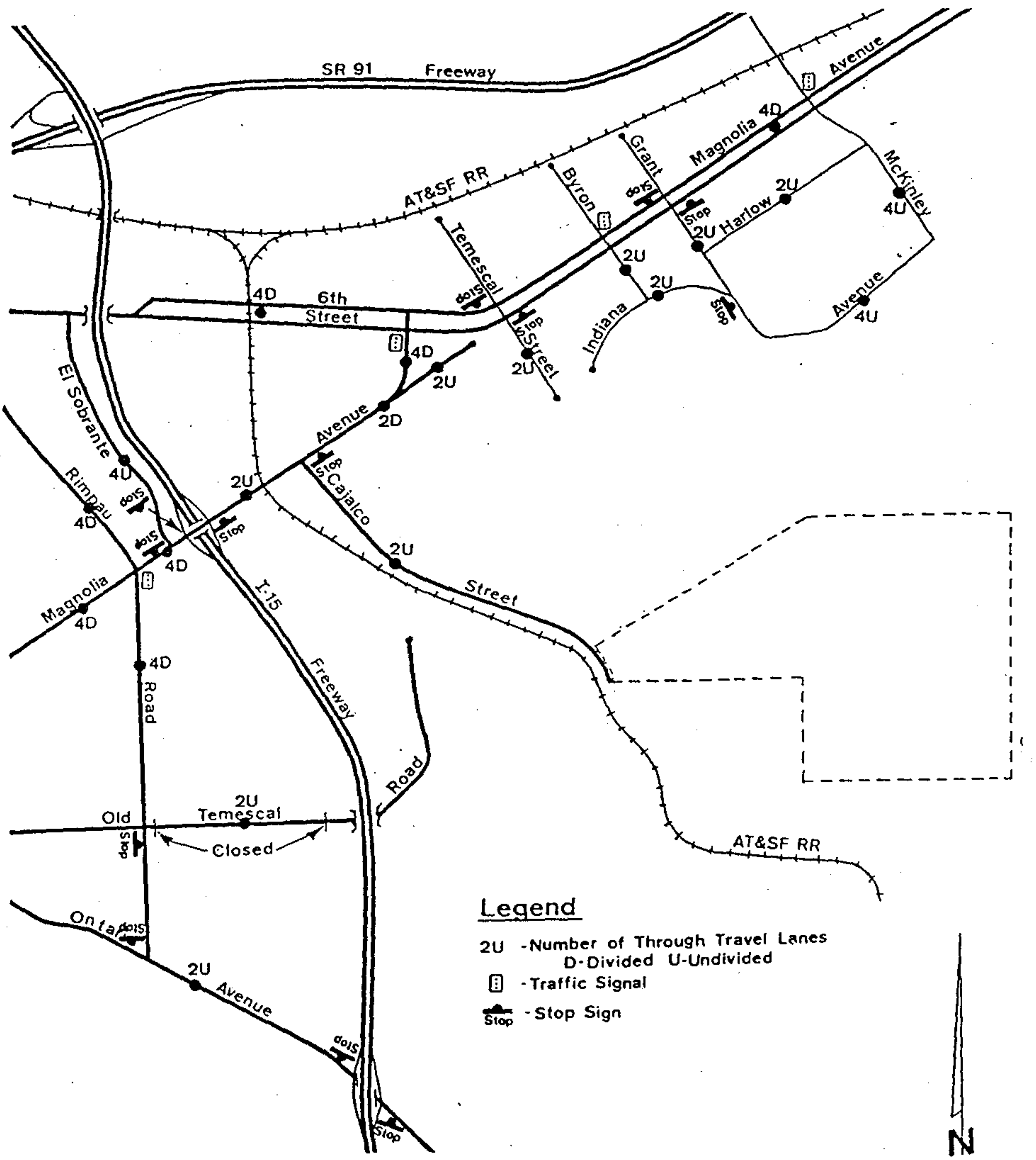


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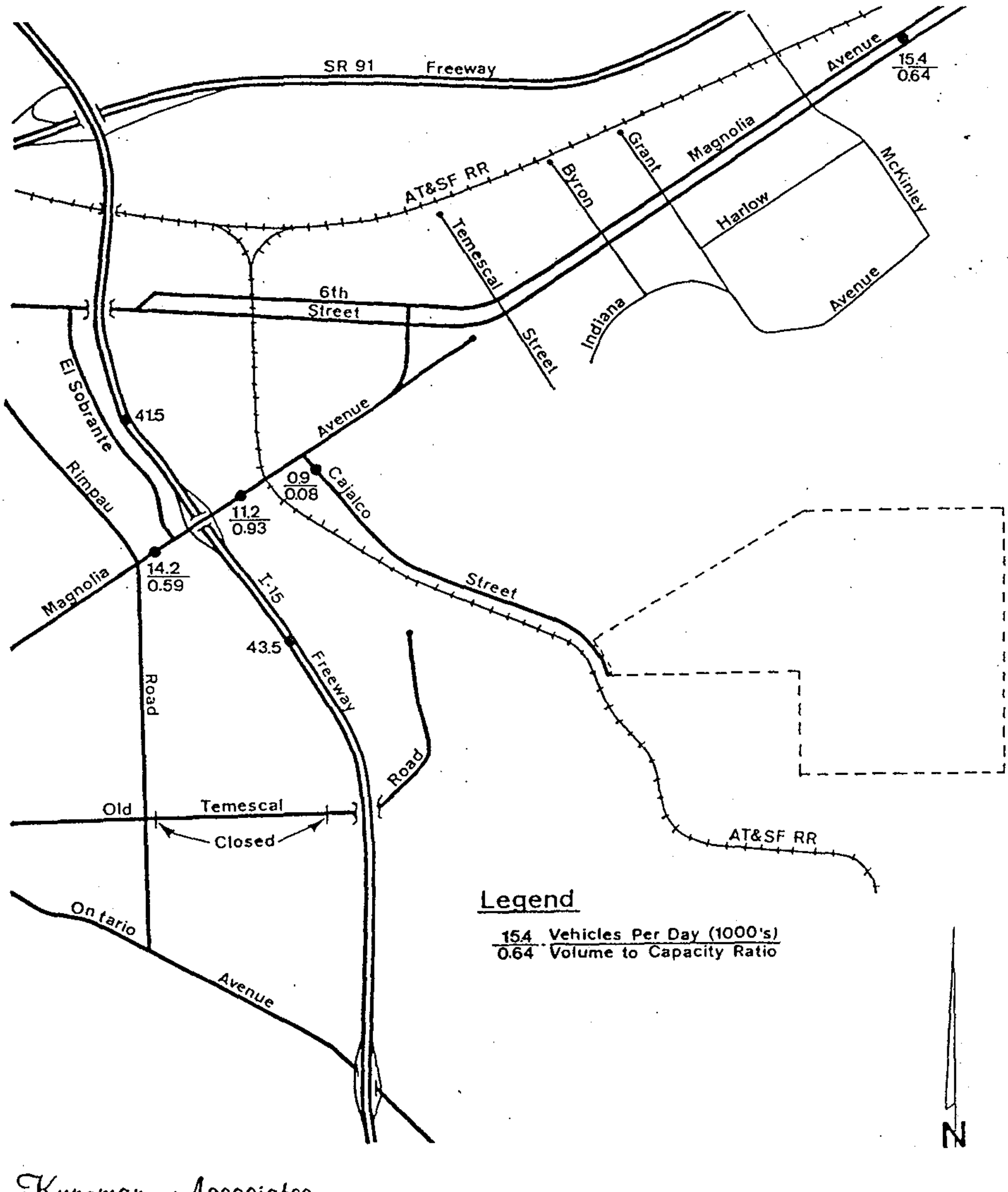
Figure 3

Existing Daily Traffic Volumes



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4. Project Traffic

To estimate project-related traffic volumes at various points on the street network, a three step process is utilized. First, the traffic which will be generated by the proposed development is determined. Secondly, the traffic volumes are geographically distributed to major attractions of trips, such as employment centers, commercial centers, recreational areas or residential areas. Finally, the trips are assigned to specific roadways and the project-related traffic volumes are determined on a route-by-route basis.

Traffic Generation

The traffic generated by a project is normally estimated by applying an appropriate set of trip generation rates to the project land use. However, trip generation rates for this type of project do not exist in the usual references. A more appropriate estimate of trip generation is obtained by reviewing the proposed operation parameters of the site.

Traffic generation for the site has been estimated based on a study of production estimates for the project and the types of trucks that will be used to haul products from the site. Assumptions have been made regarding the mix of product types that may be produced under average conditions.

A worst case analysis of the site has been estimated based on the assumption that the project will produce an average of 5,000,000 tons of aggregates in a future year during Phase 2 operation. Assuming a 6-day work week, this yields a daily average of approximately 16,025 tons of aggregates. It is also assumed that approximately 50 percent of the aggregates will be delivered as loose aggregates, and that the remainder will be used in the production of asphalt and ready-mix concrete.

Assuming an average 10 hour work day, this results in an estimate of approximately 860 truck departures a day. It is also estimated that there will be approximately 20 truck trips per day for the delivery of asphalt oil and cement to the site. With truck departures expected to be heavier in the morning hours due to early morning construction activity, it is estimated that approximately 15 percent of daily truck trips will occur during the morning peak hour with a 0.55/0.45 inbound/outbound split, and that only 2 percent of daily truck trips will occur during the evening peak hour with a 0.8/0.2 inbound/outbound split. The processing plant is also estimated to employ approximately 25 people, 7 of which would work in an office environment during normal work hours. The majority of the remaining employees are expected to work during hours which would require them to travel to and from work during off peak hours.

The resulting site trip generation is summarized in Table 3. These trip values include both truck and non-truck vehicles. The actual truck volumes are increased by a factor of 10 percent in all peak hour intersection calculations to account for the effect of heavy vehicles in the traffic stream.

Traffic Distribution and Assignment

Traffic distribution is the determination of the directional orientation of traffic. It is based on the geographical location of employment centers, commercial centers, recreational areas, or residential area concentrations.

Traffic assignment is the determination of which specific route development traffic will use, once the generalized traffic distribution is determined. The basic factors affecting route selection are minimum time path and minimum distance path. Quite often the minimum time and distance paths are one and the same. When the two paths are different, the minimum time path will usually take precedence, assuming all other considerations are equal. Other considerations might be the aesthetic quality of alternate routes, grades, and so forth. It should be noted that the minimal time path is cognizant of congestion. As a roadway's volume approaches capacity, operating speeds decrease. Ultimately, congestion on the shortest distance path will decrease the speed until an alternate path has a shorter time path, then traffic will divert to the shorter time path.

Figure 4 contains the directional distribution and assignment of the project traffic for the proposed land uses.

Project-Related Traffic

Based on the identified traffic generation and distributions, project related traffic volumes are shown in Figure 5.

Table 3

PROJECT TRAFFIC GENERATION

Time Period	Trips Generated
Morning Peak Hour	
Inbound	150
Outbound	120
Total	270
Evening Peak Hour	
Inbound	30
Outbound	20
Total	50
Daily	1,750

Source: Kunzman Associates

Figure 4

Project Traffic Distribution

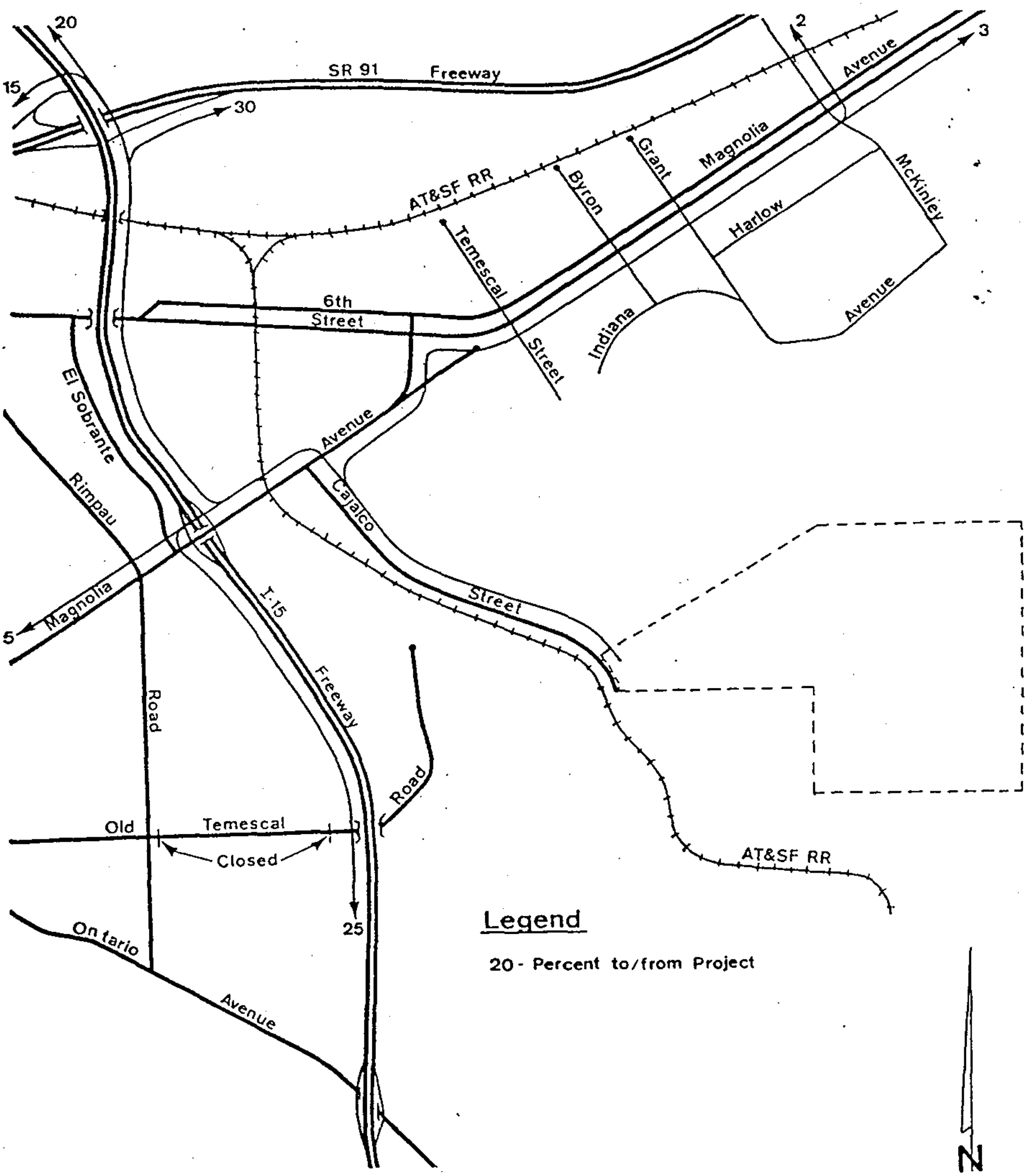

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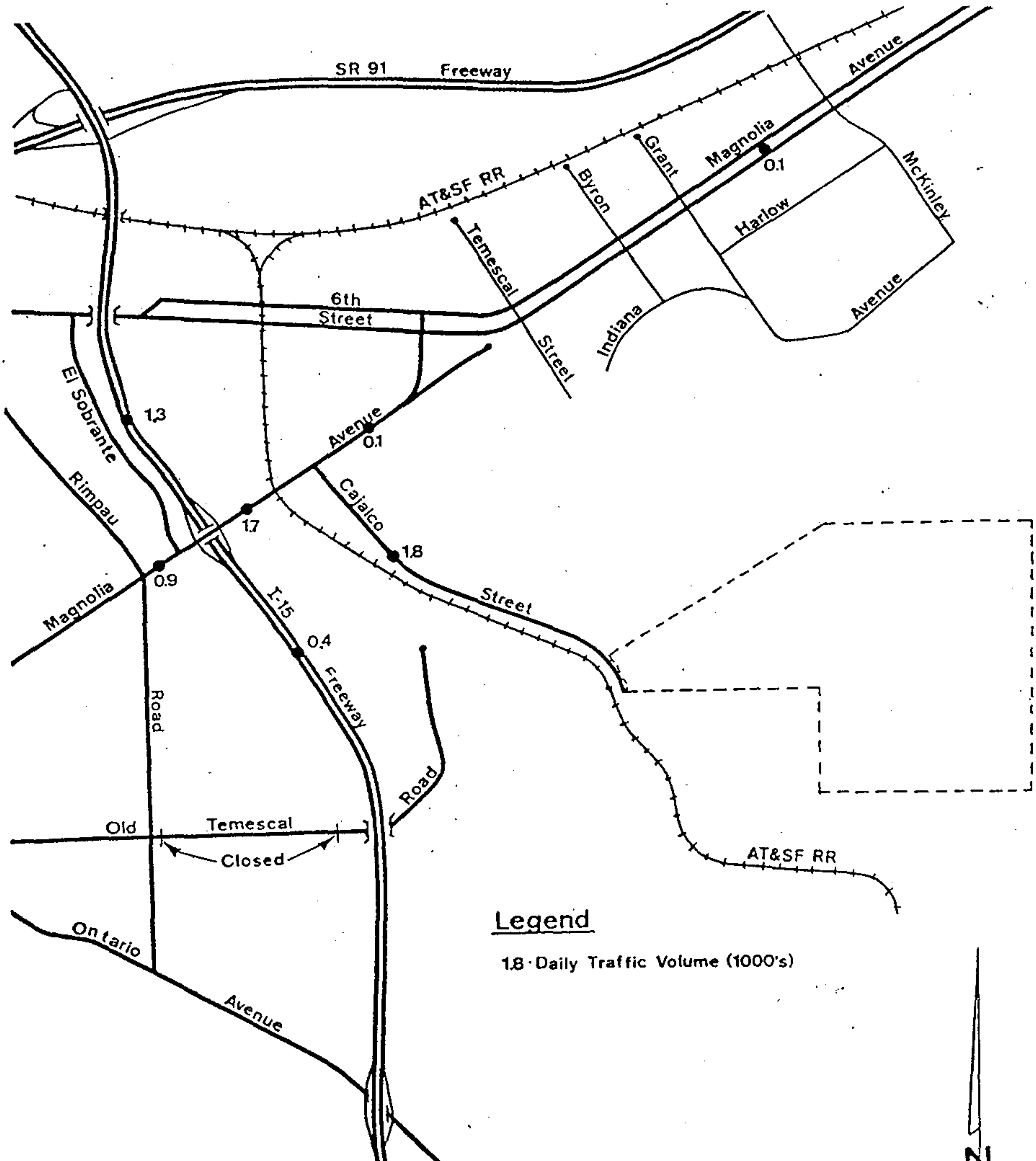
Figure 5

Project Daily Traffic Volumes



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5. Existing Plus Project Traffic Conditions

Once the project-related traffic is assigned to the existing street network and added to existing volumes, the traffic impact can be assessed. Figure 6 illustrates the existing plus project traffic conditions.

Existing Plus Project Daily Traffic Volumes

Upon project completion and occupancy the expected daily two-way traffic volumes are as illustrated in Figure 6. Figure 6 shows expected daily traffic volumes for existing plus project traffic conditions.

Existing Plus Project Daily Volume to Capacity Ratios

For existing plus project traffic volumes, daily volume to capacity ratios have been calculated and are as shown in Figure 6. Daily volume to capacity ratios are based on Level of Service C capacities. Based on daily volume to capacity, most roadways in the vicinity of the project site are projected to operate at Level of Service A for existing plus project traffic conditions. Magnolia Avenue in the vicinity of Cajalco Street will exceed its existing Level of Service C design capacity.

Existing Plus Project Intersection Capacity Utilization

Intersection Capacity Utilization (ICU) for the existing plus project traffic conditions have been calculated and are shown in Table 4. ICU calculations for the existing intersections are based on the existing geometrics at the intersections. As shown in Table 4, all intersections in the vicinity of the project are projected to operate at a Level of Service D or better in the peak hour for existing plus project traffic conditions.

The ICU worksheets in Appendix B are an example of the calculations and technique used for each critical intersection. Not all intersections for which an ICU was calculated are included in Appendix B.

Comparison of daily volume to capacity ratios and corresponding Level of Service, and peak hour Intersection Capacity Utilization and corresponding Level of Service reveals significant differences. The differences between daily link volume to capacity ratios and peak hour Intersection Capacity Utilization is particularly pronounced when cross traffic is light. Daily volume to capacity ratios assume that all cross streets require 50 percent of the time to satisfy their demand,

and assume that the subject street has 50 percent of the time available to it. The daily link volume to capacity ratios are a generalized indicator while peak hour Intersection Capacity Utilization actually represents what can be expected in the peak hour at intersections. Of the two indicators, the peak hour Intersection Capacity Utilization and corresponding Level of Service is by far the best measure of roadway performance.

Traffic Signal Warrants

A traffic signal will not be warranted at the intersection of Magnolia Avenue and Cajalco Street based on volume warrants.

Traffic signal warrants have been adopted by the Federal Highway Administration and CalTrans. These warrants are based upon the eighth highest hour volumes in a day. It is assumed by CalTrans that the eighth highest hour is 62.5 percent of the peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5 shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

Table 4

EXISTING PLUS PROJECT INTERSECTION CAPACITY UTILIZATION AND EXISTING LANE GEOMETRICS

Intersection	Intersection Approach Lanes (1)												Peak Hour ICU (2)	
	Northbound			Southbound			Eastbound			Westbound				
	T	R	L	T	R	L	T	R	L	T	R	L	AM	PM
Magnolia Avenue (EW)														
I-15 SB Ramps (NS)	0	0	0	1	1	0	0	2	1	1	2	0	45	61
I-15 NB Ramps (NS)	1	1	0	0	0	0	1	2	0	0	2	1	57	60
Cajalco Street (NS)	0	1	0	0	0	0	0	1	0	1	1	0	84	58

(1) When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

(2) Intersection Capacity Utilization (ICU)

T = Through
R = Right
L = Left

Figure 6

Existing Plus Project Daily Traffic Volumes

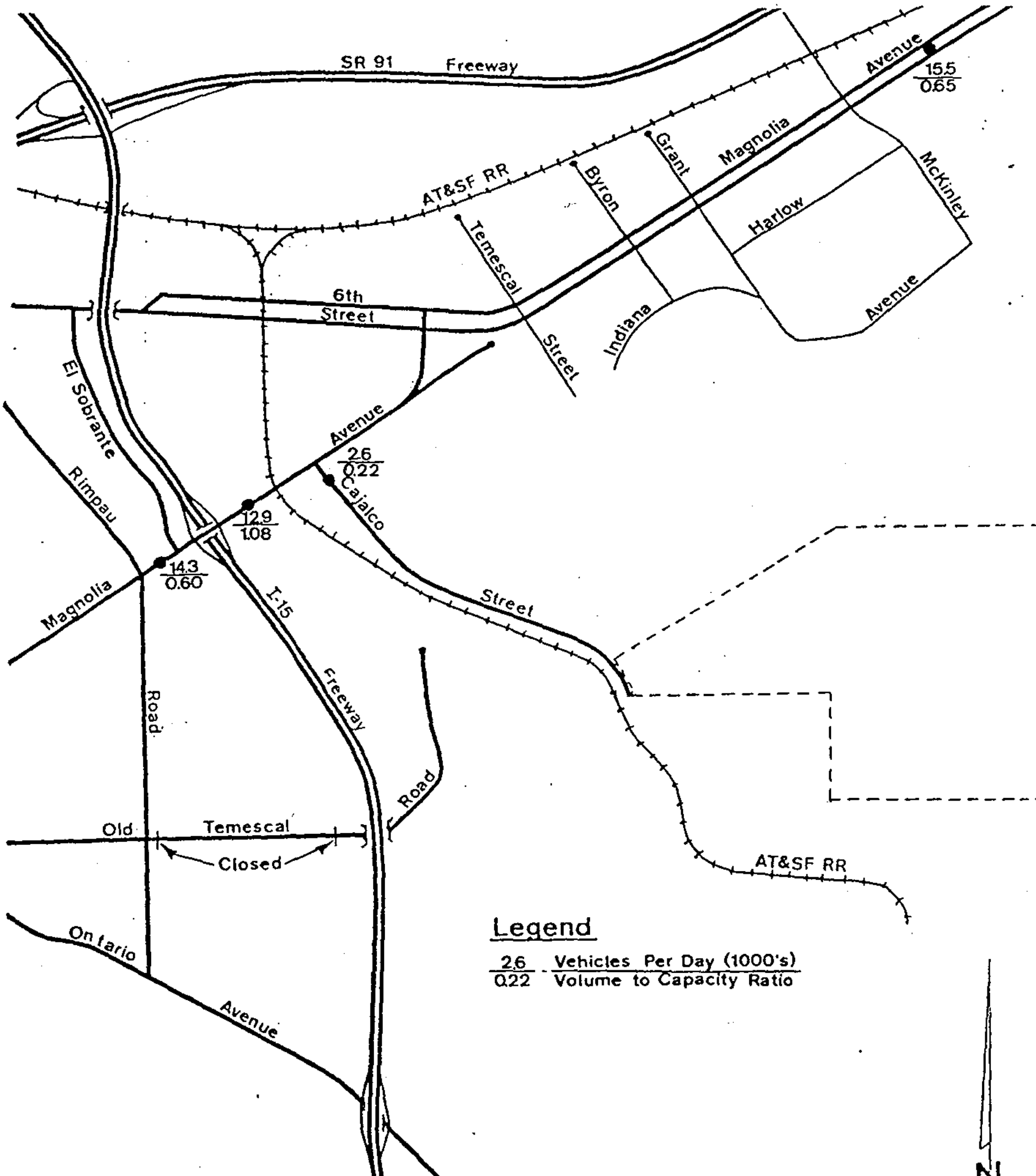

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Table 5

TRAFFIC SIGNAL WARRANTS

(Based on Estimated Average Daily Traffic - See Note 2)

URBAN .... RURAL		Minimum Requirements EADT			
1. Minimum Vehicular		Vehicles per day on major street (total of both approaches)		Vehicles per day on higher-volume minor-street approach (one direction only)	
Satisfied ______	Not Satisfied ______				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	1	8,000	5,600	2,400	1,680
2 or more	1	9,600	6,720	2,400	1,680
2 or more	2 or more	9,600	6,720	3,200	2,240
1	2 or more	8,000	5,600	3,200	2,240
2. Interruption of Continuous Traffic		Vehicles per day on major street (total of both approaches)		Vehicles per day on higher-volume minor-street approach (one direction only)	
Satisfied ______	Not Satisfied ______				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	1	12,000	8,400	1,200	850
2 or more	1	14,400	10,080	1,200	850
2 or more	2 or more	14,400	10,080	1,600	1,120
1	2 or more	12,000	8,400	1,600	1,120
3. Combination		2 Warrants		2 Warrants	
Satisfied ______	Not Satisfied ______				
No one warrant satisfied but following warrants fulfilled					
80% or more	______ 1 ______ 2				

NOTE:

1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.
2. To be used only for NEW INTERSECTIONS or other locations where actual traffic volumes cannot be counted.

Source: CalTrans, Traffic Manual, page 9-8

Appendices

Appendix A - Glossary of Transportation Terms

Appendix B - Explanation and Calculation of Intersection Capacity Utilization

APPENDIX A

GLOSSARY OF TRANSPORTION TERMS

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
CalTrans:	California Department of Transportation
DU:	Dwelling Unit
EMA:	Environmental Management Agency
FAU:	Federal Aid Urban
FHWA:	Federal Highway Administration
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway which limits the amount of traffic which can proceed downstream from its location.

CAPACITY: The maximum number of vehicles which can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Same as yellow time.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic which will result in a volume during the peak hour equal to the capacity of the roadway.

DAILY TRAFFIC: Same as average daily traffic.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FIXED TIME SIGNAL: Same as pretimed signal.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections which are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LINK: The roadway segment between any two intersections.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire imbedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal which directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL COORDINATION: Same as interconnected signal system.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal which directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination; i.e. each trip has two trip-ends. A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quality of trips produced and/or attracted attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other.

VEHICLE MILES: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length in miles.

APPENDIX B

EXPLANATION AND CALCULATION
OF INTERSECTION CAPACITY UTILIZATION

EXPLANATION AND CALCULATION OF INTERSECTION CAPACITY UTILIZATION (ICU)

The ability of a roadway to carry traffic is referred to as capacity. The capacity is usually greater between intersections and less at intersections because traffic flows continuously between them and only during the green phase at them. Capacity at intersections is best defined in terms of vehicles per lane per hour of green. If capacity is 1600 vehicles per lane per hour of green, and if the green phase is 50 percent of the cycle and there are three lanes, then the capacity is 1600 times 50 percent times 3 lanes, or 2400 vehicles per hour.

The technique used to compare the volume and capacity at an intersection is known as Intersection Capacity Utilization (ICU). ICU, usually expressed as a percent, is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity, then 20 percent of the signal cycle is not used. The signal could show red on all indications 20 percent of the time and the signal would just accommodate approaching traffic.

ICU analysis consists of (a) determining the proportion of signal time needed to serve each conflicting movement of traffic, (b) summing the times for the movements, and (c) comparing the total time required to the total time available. For example, if for north-south traffic the northbound traffic is 1600 vehicles per hour, the southbound traffic is 1200 vehicles per hour, and the capacity of either direction is 3200 vehicles per hour, then the northbound traffic is critical and requires 1600/3200 or 50 percent of the signal time. If for the east-west traffic 30 percent of the signal time is required, then it can be seen that the ICU is 50 plus 30, or 80 percent. When left turn phases exist, they are incorporated into the analysis. The critical movements are usually the heavy left turn movements and the opposing through movements.

Level of service is used to describe the quality of traffic flow. Levels of Service A to C operate quite well. Level of Service C is typically the standard to which rural roads are designed, and level of Service D is the standard to which urban roadways are typically designed. Level of Service D is characterized by fairly restricted traffic flow. Level of Service E is the maximum volume a facility can accomodate and will result in possible stoppages of momentary duration. Level of Service F occurs when a facility is overloaded and is characterized by stop-and-go traffic with stoppages of long duration. A description of the various levels of traffic service appears on the following page, along with the relationship between ICU and level of traffic service.

The ICU calculation assumes that an intersection is signalized and that the signal is ideally timed. Although calculating ICU for an unsignalized intersection is invalid, the presumption is that a signal can be installed and the calculation shows whether the geometrics are capable of accommodating the expected volume with a signal. It is possible to have an ICU well below 100 percent, yet have severe traffic congestion. This would occur if one or more movements is not getting sufficient green time to satisfy its demand, and excess green time exists on other movements. This is an operational problem which should be remedied.

Capacity is often defined in terms of roadway width; however, standard lanes have approximately the same capacity whether they are 11 or 14 feet wide. Our data indicates a typical lane, whether a through lane or a left turn lane, has a capacity of approximately 1750 vehicles per hour, with nearly all locations showing a capacity greater than 1600 vehicles per hour per lane. This finding is published in the August, 1978 issue of ITE Journal in the article entitled, "Another Look at Signalized Intersection Capacity" by William Kunzman. For this study, a capacity of 1600 vehicles per hour per lane will be assumed for both through and left turn lanes.

The yellow time can either be assumed to be completely used and no penalty applied, or it can be assumed to be only partially usable. Total yellow time accounts for less than 10 percent of a cycle, and a penalty up to three percent is reasonable. On the other hand, during peak hour traffic operation the yellow times are nearly completely used. If there are no left turn phases, the left turn vehicles completely use the yellow time. If there are left turn phases, the through traffic continues to enter the intersection on the yellow until just a split second before the red. In this study no penalty will be applied for the yellow because the capacities have been assumed to be only 1600 vehicles per hour per lane when in general they are 1750.

The ICU technique is an ideal tool to quantify existing as well as future intersection operation. The impact of adding a lane can be quickly determined by examining the effect the lane has on the intersection capacity utilization.

ICU parallels another calculation procedure known as the Critical Lane Method with one exception. Critical Lane Method dimensions capacity in terms of standardized vehicles per hour per lane. A Critical Lane Method result of 800 vehicles per hour means that the intersection operates as though 800 vehicles were using a single lane continuously. If one assumes a lane capacity of 1600 vehicles per hour, then a Critical Lane Method calculation resulting in 800 vehicles per hour is the same as an ICU calculation of 50 percent since 800/1600 is 50 percent. It is our opinion that the Critical Lane Method is inferior to the ICU method simply because a statement such as "The Critical Lane Method value is 800 vehicles per hour" means little to most persons, whereas a statement such a "the Intersection Capacity Utilization is 50 percent" communicates clearly. A Critical Lane Method of ICU correspondence table is as follows, assuming a lane capacity of 1600 vehicles per hour.

Critical Lane Method Result	Corresponding ICU Result
800 vehicles per hour	50 percent
960 vehicles per hour	60 percent
1120 vehicles per hour	70 percent
1280 vehicles per hour	80 percent
1440 vehicles per hour	90 percent
1600 vehicles per hour	100 percent

LEVEL OF SERVICE DESCRIPTION

Level of Service	Description	Stopped Delay Per Vehicle (Seconds)	Intersection Capacity Utilization (Percent)
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 5.0	0 to 60
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	5.1 to 15.0	61 to 70
C	Level of Service generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	15.1 to 25.0	71 to 80
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	25.1 to 40.0	81 to 90
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	40.1 to 60.0	91 to 100
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the inter-section. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	60.1 +	100 +

Source: "Highway Capacity Manual" Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 1985, Pages 9-4 to 9-5.

Intersection: I-15 SB Ramps (NS) / Magnolia Ave. (EW)

Project: Corona Quarry - CalMat

Traffic Condition: Background Traffic
Lane Configuration: Initial Existing

AM Intersection Capacity Analysis

Move	Lanes	Capacity	Volume	V/C Ratio
NL	0	0	0	0.00*
NT	0	0	0	0.00
NR	0	0	0	0.00
SL	1	1600	100	0.07
ST	1	1600	0	0.08*
SR	0	0	130	0.09
EL	0	0	0	0.00
ET	2	3200	350	0.11*
ER	1	1600	100	0.07
WL	1	1600	310	0.19*
WT	2	3200	550	0.17
WR	0	0	0	0.00
Sum of Critical Movements =				0.38

PM Intersection Capacity Analysis

Move	Lanes	Capacity	Volume	V/C Ratio
NL	0	0	0	0.00
NT	0	0	0	0.00
NR	0	0	0	0.00
SL	1	1600	50	0.07
ST	1	1600	0	0.11*
SR	0	0	180	0.13
EL	0	0	0	0.00
ET	2	3200	440	0.14
ER	1	1600	360	0.23*
WL	1	1600	420	0.26*
WT	2	3200	400	0.13
WR	0	0	0	0.00
Sum of Critical Movements =				0.60

* denotes critical movement

Intersection: I-15 NB Ramps (NS) / Magnolia Ave (EW)

Project: Corona Quarry - CalMat

Traffic Condition: Background Traffic
Lane Configuration: Initial Existing

AM Intersection Capacity Analysis

Move	Lanes	Capacity	Volume	V/C Ratio
NL	1	1600	280	0.18
NT	1	1600	0	0.33*
NR	0	0	520	0.37
SL	0	0	0	0.00*
ST	0	0	0	0.00
SR	0	0	0	0.00
EL	1	1600	70	0.07*
ET	2	3200	340	0.11
ER	0	0	0	0.00
WL	0	0	0	0.00
WT	2	3200	450	0.14*
WR	1	1600	50	0.07
				=======
	Sum of Critical Movements =			0.54

PM Intersection Capacity Analysis

Move	Lanes	Capacity	Volume	V/C Ratio
NL	1	1600	110	0.07
NT	1	1600	0	0.28*
NR	0	0	450	0.32
SL	0	0	0	0.00*
ST	0	0	0	0.00
SR	0	0	0	0.00
EL	1	1600	120	0.08*
ET	2	3200	430	0.13
ER	0	0	0	0.00
WL	0	0	0	0.00
WT	2	3200	730	0.23*
WR	1	1600	50	0.07
				=======
	Sum of Critical Movements =			0.59

* denotes critical movement

Intersection: Cajalco St (NS) / Magnolia Ave (EW)

Project: Corona Quarry - CalMat

Traffic Condition: Background Traffic
Lane Configuration: Initial Existing

AM Intersection Capacity Analysis

Move	Lanes	Capacity	Volume	V/C Ratio
NL	0	0	40	0.07*
NT	1	1200	0	0.07
NR	0	0	10	0.07
SL	0	0	0	0.00
ST	0	0	0	0.00*
SR	0	0	0	0.00
EL	0	0	0	0.00
ET	1	1600	780	0.52*
ER	0	0	50	0.07
WL	1	1600	20	0.07*
WT	1	1600	540	0.34
WR	0	0	0	0.00
			Sum of Critical Movements =	0.66

PM Intersection Capacity Analysis

Move	Lanes	Capacity	Volume	V/C Ratio
NL	0	0	20	0.07*
NT	1	1200	0	0.07
NR	0	0	20	0.07
SL	0	0	0	0.00
ST	0	0	0	0.00*
SR	0	0	0	0.00
EL	0	0	0	0.00
ET	1	1600	660	0.42*
ER	0	0	10	0.07
WL	1	1600	10	0.07*
WT	1	1600	750	0.47
WR	0	0	0	0.00
			Sum of Critical Movements =	0.56

* denotes critical movement

Intersection: I-15 SB Ramps (NS) / Magnolia Ave. (EW)

Project: Corona Quarry - CalMat

Traffic Condition: Background + Project Traffic
Lane Configuration: Initial Existing

AM Intersection Capacity Analysis

Move	Lanes	Capacity	Background	Project	Total	V/C Ratio
			VOLUMES			
NL	0	0	0	0	0	0.00
NT	0	0	0	0	0	0.00*
NR	0	0	0	0	0	0.00
SL	1	1600	100	110	210	0.13*
ST	1	1600	0	0	0	0.08
SR	0	0	130	0	130	0.09
EL	0	0	0	0	0	0.00
ET	2	3200	350	8	358	0.11*
ER	1	1600	100	0	100	0.07
WL	1	1600	310	32	342	0.21*
WT	2	3200	550	6	556	0.17
WR	0	0	0	0	0	0.00

Sum of Critical Movements = 0.45

PM Intersection Capacity Analysis

Move	Lanes	Capacity	Background	Project	Total	V/C Ratio
			VOLUMES			
NL	0	0	0	0	0	0.00
NT	0	0	0	0	0	0.00
NR	0	0	0	0	0	0.00
SL	1	1600	50	19	69	0.07
ST	1	1600	0	0	0	0.11*
SR	0	0	180	0	180	0.13
EL	0	0	0	0	0	0.00
ET	2	3200	440	1	441	0.14
ER	1	1600	360	0	360	0.23*
WL	1	1600	420	5	425	0.27*
WT	2	3200	400	1	401	0.13
WR	0	0	0	0	0	0.00

Sum of Critical Movements = 0.61

* denotes critical movement

Intersection: I-15 NB Ramps (NS) / Magnolia Ave (EW)

Project: Corona Quarry - CalMat

Traffic Condition: Background + Project Traffic
Lane Configuration: Initial Existing

AM Intersection Capacity Analysis

Move	Lanes	Capacity	VOLUMES Background	Project	Total	V/C Ratio
NL	1	1600	280	0	280	0.18
NT	1	1600	0	0	0	0.35*
NR	0	0	520	42	562	0.40
SL	0	0	0	0	0	0.00*
ST	0	0	0	0	0	0.00
SR	0	0	0	0	0	0.00
EL	1	1600	70	0	70	0.07*
ET	2	3200	340	118	458	0.14
ER	0	0	0	0	0	0.00
WL	0	0	0	0	0	0.00
WT	2	3200	450	38	488	0.15*
WR	1	1600	50	84	134	0.08

Sum of Critical Movements = 0.57

PM Intersection Capacity Analysis

Move	Lanes	Capacity	VOLUMES Background	Project	Total	V/C Ratio
NL	1	1600	110	0	110	0.07
NT	1	1600	0	0	0	0.29*
NR	0	0	450	7	457	0.33
SL	0	0	0	0	0	0.00*
ST	0	0	0	0	0	0.00
SR	0	0	0	0	0	0.00
EL	1	1600	120	0	120	0.08*
ET	2	3200	430	20	450	0.14
ER	0	0	0	0	0	0.00
WL	0	0	0	0	0	0.00
WT	2	3200	730	6	736	0.23*
WR	1	1600	50	13	63	0.07

Sum of Critical Movements = 0.60

* denotes critical movement

Intersection: Cajalco St (NS) / Magnolia Ave (EW)

Project: Corona Quarry - CalMat

Traffic Condition: Background + Project Traffic
Lane Configuration: Initial Existing

AM Intersection Capacity Analysis

Move	Lanes	Capacity	VOLUMES Background	Project	Total	V/C Ratio
NL	0	0	40	122	162	0.12
NT	1	1200	0	0	0	0.15*
NR	0	0	10	6	16	0.07
SL	0	0	0	0	0	0.00*
ST	0	0	0	0	0	0.00
SR	0	0	0	0	0	0.00
EL	0	0	0	0	0	0.00
ET	1	1600	780	0	780	0.62*
ER	0	0	50	160	210	0.15
WL	1	1600	20	8	28	0.07*
WT	1	1600	540	0	540	0.34
WR	0	0	0	0	0	0.00
						=======
			Sum of Critical Movements =			0.84

PM Intersection Capacity Analysis

Move	Lanes	Capacity	VOLUMES Background	Project	Total	V/C Ratio
NL	0	0	20	19	39	0.07*
NT	1	1200	0	0	0	0.07
NR	0	0	20	1	21	0.07
SL	0	0	0	0	0	0.00
ST	0	0	0	0	0	0.00*
SR	0	0	0	0	0	0.00
EL	0	0	0	0	0	0.00
ET	1	1600	660	0	660	0.44*
ER	0	0	10	27	37	0.07
WL	1	1600	10	1	11	0.07*
WT	1	1600	750	0	750	0.47
WR	0	0	0	0	0	0.00
						=======
			Sum of Critical Movements =			0.58

* denotes critical movement

Appendix
5.12

Blasting Report

DON HARRIS & ASSOCIATES

P.O. Box 426
Arnold, CA 95223
(209) 795-4495

September 26, 1988

Donna McCormick
Florian Martinez Associates
15641 Red Hill Avenue, Suite 205
Tustin, California 92680-7383

RECEIVED
SEP 1988

Re: CalMat - Corona Quarry

Dear Donna;

Please find enclosed the Draft of a report, indicating my impressions and comments regarding proposed blasting activity in the above quarry and potential effects on the surrounding area. these comments are the result of my visit to the site on Thursday, September 15, 1988.

As you can see, I do not anticipate any serious adverse effects from blasting other than the expected changes in the topographic features within the property boundries.

The principal recommendation I have, at this time, is to start a site weather monitoring program, as soon as practical to obtain information which will assist in developing specific blasting parameters and limitations, if necessary.

As progress continues, I would appreciate being kept up to date on any developments which could have an impact on the blasting plans. Also, the copy of the July 1988, Reclamation Plan, I received last week did not include Page 32 (3.3.12 - Blasting). I would appreciate receiving a copy of this for my reference.

After you have had an opportunity to review this Draft, please advise me of any corrections, deletions, or additions you feel are appropriate.

Yours very truly;

Donald G. Harris

cc: Mr. Edward D. Elkins
CalMat Company

DRAFT REPORT

CalMat Company

CORONA QUARRY

September 23, 1988

I. SCOPE:

The following information, conclusions, and recommendations are the result of a brief, one day, visit to the site of the proposed CalMat, Corona Quarry. This property is located in Riverside County, south of the Riverside Freeway (Route 91) and east of the Corona Freeway (I-15).

A tour of the surrounding inhabited areas was made to observe the general conditions as they might pertain to blasting operations within the proposed quarry.

II. Observations:

The existing pit on the site has a predominent exposed face directed westerly. Development of the ultimate quarry will also show maximum exposure to the west. Since there is "open space" to the east and south of the property, no consideration has been given to blasting effects in these directions. Because of the orientation of the principal exposed face and other factors, that will be addressed below, the main concern regarding blasting effects will be to the west and, to a much lesser degree, to the north.

individual particles to oscillate in random directions. If these vibrations are of sufficient intensity, they may cause structural damage. However, as they move through the earth and expend energy, they become weaker as a direct fubction of distance. The further away, the lower the vibration intensity.

Numerous studies have determined that both the Frequency (cycles per second) of the vibrating waves and the Peak (maximum) Particle Velocity are contributing factors in blast related damage. However, in this geologic environment and the blasting techniques anticipated, Peak Particle Velocity is considered to be the most critical and appropriate descriptor.

For many years a value of 2 inches per second (Peak Particle Velocity) has been assumed as a threshold value for extremely minor damage to wood-frame construction (houses) under the conditions mentioned above. However, a more conservative value of 1 inch per second has, in recent years, become more widely accepted and would be appropriate for the situation in this case.

Since these values represent actual ground motion, they are not to be confused with the swaying of a building, for example, which may be very noticeable to occupants but not damaging to the structure itself.

Seismic monitoring at the commencement of operations would increase the above limitation considerably if it should prove to be advantageous from an operating standpoint.

It is not anticipated that ground vibrations will be a damage or annoyance threat to any of the surrounding facilities or structures.

The second effect from blasting operations, mentioned at the beginning of this section (III Blasting Effects) is noise or Air Blast. Air Blast is a compressive wave that travels through the atmosphere. If this wave is audible it is called noise while Air Blast at frequencies below 20 Hz (inaudible to the human ear) is called concussion. This wave creates a pressure in the air greater than the normal atmospheric pressure and can be measured as an "over-pressure" and expressed as pounds per square inch (psi). This pressure can be converted to decibels (Db), which is a more common expression for sound, since it approximates the response of the human ear.

Air Blast from an explosive shot can be produced by several mechanisms. Primarily it is the result of energy which has not been confined at the site and is allowed to escape into the atmosphere. In order to achieve satisfactory fragmentation in an operation such as the one proposed , it is impossible to prevent some energy release. Therefore, there will always be some noise associated with the blasting.

Once a sound wave from a blast enters the atmosphere it is virtually uncontrollable. However, there are certain natural conditions that may determine its direction and local intensity. Temperature inversions in the atmosphere will cause the wave to be refracted or bent away from its natural course. Reflection will occur off surfaces such as the pit walls. Wind will distort the wave pattern and warp it downwind or possibly back toward the earth. These factors are beyond the blasters control but should be recognized and avoided, if possible. It has been demonstrated that at times several of the above circumstances are present at one time. The wall reflected, inversion bent, wind carried wave might produce a focal point at considerable distance from the blast site. The overpressure at this location could be many times greater than at a closer distance.

Since window panes are probably the weakest part of a structure subjected to Air Blast, they are most likely to be the first indication of this effect. Poorly mounted or prestressed frames will be broken most easily.

Actual damage from Air Blast is uncommon. The principal effects are (1) the rattling of windows and (2) noise that startles people. Occasionally the Ground Vibrations and the Air Blast appear at a location at approximately the same time, thereby magnifying the apparent intensity. Individuals assume that since their windows rattled and they heard a blast, their house must have been violently shaken and damaged. Even without this assumption, they may have been startled, awakened or in other ways disturbed. Complaints may then result due to this subjective response. The disturbance may be simply annoying or can be intollerable.

There are several things the Corona Quarry should consider to minimize the effects of Air Blast. However, operational requirements may preclude the enactment of certain precautions. The following are general guidelines that may be helpful in controlling Air Blast effects:

1. Keeping Ground Vibrations to a minimum and thereby avoiding enhancement of the Air Blast.

2. Use down-the-hole initiation and avoid the use of high strength detonating cord.

3. Maintaining an adequate burden (cover in front and above) on all explosive charges.

4. Pay particular attention to weak zones within the rock formation which could cause excessive energy release and place non-explosive decks through these zones.

5. Keep face heights to a minimum, practical level.

6. Provide sufficient time between adjacent holes to help prevent Air Blast reinforcememt.

7. To the extent possible, avoid blasting during meteorological conditions that might produce Air Blast focusing (temperature inversions, wind strength and direction).

8. Reduce the frequency of blasting by increasing the blast sizes.

The OSHA maximum level for "impulsive sound" is 140 Decibels or 0.030 psi.. However, damage to large, single-strength, aged glass panes has been reported at that level. In Technical Progress Report 78, dated May 1974, the U.S. Bureau of Mines has recommended the following limits for Air Blast to minimize the probability of both annoyance and structural damage.

Sound Level Meter Scale

	Linear-Peak	C-Peak	A-Peak
Safe Level	128 dB (.007psi)	120 dB	95 dB
Maximum	136 dB (.018psi)	130 dB	115 dB

The third environmental factor to be considered, with regard to blasting at this location, is the airborn dust and smoke created from a blast.

An explosive detonation creates a number of gasses, some of which are toxic in high concentrations. However, quarry type operations, such as proposed at the Corona site, are not conducive to generating sufficient concentrations at the site itself and certainly not to the surrounding area.

The dust generated from a blast, composed of soil and rock particles, is relatively heavy and therefore settles to earth quite rapidly. If wind conditions prevail, this dust will naturally be carried downwind and be dissipated over a wider area.

Recommendations:

Based on the above, the following recommendations are offered, with the understanding that there may be circumstances or information of which I am not aware, that may alter my opinions:

1. It is recommended that initial blast designs do not exceed 2000 pounds of explosives per 8 ms delay period. Seismic monitoring would probably increase this limitation considerably, without exceeding a 1 inch per second Peak Particle Velocity at nearby residential structures and be acceptable.

2. I feel it would be advisable to commence obtaining accurate area or site specific weather data regarding temperature inversions and wind conditions as soon as possible. The time of day this imformation is acquired woukd be critical to assist in determining blast times that would have the least effect on surrounding facilities. The results from this study will be pertinent to Air Blast and dust control.

DON HARRIS & ASSOCIATES

P.O. Box 426
Arnold, CA 95223
(209) 795-4495

DRILLING AND BLASTING PLAN

CalMat - Corona Quarry

November 28, 1988

The proposed plan as outlined in the "Plan For Reclamation" dated July 1988, states that initial production will come from the lower elevations to provide a permanent Plant Site area. Phase II will be a top-to-bottom ultimate pit, commencing at the higher elevations and stepping downward in benches. The following comments are based on the anticipated production schedule contained in this Plan.

To process material through the plant facilities planned for this operation, the rock must first be broken into small enough pieces to allow equipment to dig and transport it from the quarry floor. Since explosive energy cannot be effeciently applied by simply placing explosives on top of a rock mass, the first step in fragmenting the material is the drilling of "blast holes." When a sufficient number of holes of the proper diameter, depth, and spacing have been drilled to produce the desired quantity of broken rock, explosives are loaded and initiated in these holes.

For the type of operation planned for the CalMat, Corona Quarry two factors are critical for safe and efficient production. First: the rock must be properly fragmented, not too coarse or too fine, for handling and processing. Second: the broken rock must be confined within a relatively small area to avoid loss, prevent contamination with other rock types, minimize the size of the "safe zone", and facilitate the recovery process.

Drilling and blasting is both a science and an art. No two operations or even individual blasts, are identical. Therefore, before any drilling commences the physical and geological conditions are studied and determinations are made as to how to layout the quarry or individual "shot", to achieve the desired results.

Depending upon anticipated production demands, geological conditions, safety requirements, and costs, various pre-production studies will be made to select the proper equipment for this operation. Based on the type and scale of operation planned for the CalMat, Corona Quarry it is anticipated that large "front-end loaders" will be used to dig the broken rock and load it into large hauling trucks for transport to the crushing plant. To meet the production schedules indicated in the July 1988 "A Plan For Reclamation: Corona Quarry" the following general drilling parameters would be appropriate:

that, except for a temporary dust and smoke cloud, unless someone happened to be looking in the proper direction, they would not see the blast.

Although the smoke from a blast contains some toxic gasses such as carbon monoxide and oxides of nitrogen, the atmosphere reduces their concentration to well below allowable limits almost immediatly. Therefore, blasting in an open excavation, as in this case, presents no toxic concern to local vegetation, wildlife, or humans.

Techniques have been developed over the years and aare in common usage to prevent excessive ground vibrations from blasting operations and avoidance of noise related problems. Although weather conditions can effect the magnitude and direction of blast noise, proper scheduling and timing of blasts will mitigate the circumstances and avoid disturbance in areas where there may be concern.

The explosives to be used will be safe, efficient, and specifically designed for this type of operation. These modern explosive products are highly controllable and manufactured to very close tollerances to provide adequate energy release without producing excessive results. The initiating devices are designed to provide the user with the capability of determining the precise quantity of explosives to be detonated within any time frame. They will be confined within the blast holes to avoid excessive noise and produce maximum control.

Safety is always the primary concern of anyone involved in the use, handling, transportation, or storage of explosives. For this reason the explosives industry has an extremely good record with regard to accidents. There are very strict regulations governing the transport of "Hazardous Materials," such as explosives, prepared by the Federal Department of Transportation and other State and Local agencies. These regulations stipulate types of acceptable containers, vehicle safety, driver competence, routes to be followed, unloading devices, etc.. Storage facilities must comply with the Bureau of Alcohol, Tobacco, and Firearms standards with regard to construction, materials contained, quantities of explosives, location, security, etc.. Facilities are inspected regularly by qualified individuals from various Federal, State and local agencies that have responsibilities regarding explosives. The Occupational Safety and Health Administration and the Mine Safety and Health Administration also have regulations regarding the transportation, storage and safe handling of explosive products on site. Due to the nature of the material involved, personnel selected for explosives handling are carefully chosen and trained. Both company management and insurance carriers are partiicularly strict with regard to safety practices where explosives are concerned.

Close to the time of a blast the site is cleared of people, warning signals are sounded and visual inspect-iions are made to be certain that no unauthorized people are in the area, Subsequent to the blast an inspection is required to ascertain that things went as planned. If not, corrective action is taken immediatly before an "all clear" signal is given.

Blasting is a relatively minor but very important step in the production of rock products. It has been demonstrated that explosives can be used effectively and safely for a wide variety of uses essential to our modern life if used properly. Therefore, only qualified, exper-iienced, State licensed blasters are permitted to design, supervise the loading, and shoot explosives.

Appendix
5.13

Letter from Temescal Water Company

TEMESCAL WATER COMPANY

P.O. Box 669, Corona, California 91718-0669
Telephone: (714) 737-6700

November 29, 1988

Calmat
3200 San Fernando Road
Los Angeles, CA 90065

Attention: Tom Davis

Gentlemen:

Re: Arlington/Corona Pipeline Relocation

We have reviewed subject relocation in the preliminary alignment phase. We do not oppose the relocation provided it is constructed in accordance with our standards for pipeline construction.

We must review the final alignment in the field prior to design. We will perform all excavation for location verification once an alignment has been approved.

Very truly yours,

TEMESCAL WATER COMPANY

By F. E. Wood

F. E. Wood,
President

FEW:ea

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CALMAT PROPERTIES