Otay Hills Construction Aggregate and Inert Debris Engineered Fill Operation Project

Appendix G

Acoustical Site Assessment Report

for the

Public Review
Draft Environmental Impact Report

PDS2004-3300-04-004 (MUP);
PDS2004-3310-04-001 (RP);
PDS2010-3813-10-002 (SPA);
Log No. 04-190-04

June 2020

Prepared for:

County of San Diego
Planning & Development Services
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Acoustical Site Assessment Report

Otay Hills Construction Aggregate and Inert Debris Engineered Fill Operation Project

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GLOSSARY OF TERMS AND ACRONYMS

A-Weighted Sound Levels	Decibels (referenced to 20 micro-Pascals) as measured with an A-weighting network of standard sound level meter, abbreviated dB(A)
ADT	average daily trips
AMSL	above mean sea level
ANSI	American National Standards Institute
APN	Assessor's Parcel Number
CADNA	Computer Aided Noise Abatement
CAGN	California gnatcatcher
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
County	San Diego County
Daytime	Time period from 7:00 a.m. to 10:00 p.m.
dB	decibel
dBA	A-weighted decibel
DNL or L_{DN}	Day-Night Sound Level - A 24-hour average, where sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting, but no added weighting on the evening hours, abbreviated as DNL or L_{DN}
du	dwelling unit
EOSMP	East Otay Mesa Specific Plan
Evening	Time period from 7:00 p.m. to 10:00 p.m.
HNL	Hourly Noise Level
HT	heavy truck
Hz	Hertz
I-805	Interstate 805
IDEFO	Inert Debris Engineered Fill Operation
kHz	kilohertz
kV	kilovolt
L_{EQ}	Average sound energy over a specified period, usually one hour, unless specified otherwise

MM	Mitigation Measure
mPa	Micro-Pascals
mph	miles per hour
MT	medium truck
MUP	Major Use Permit
Nighttime	Periods other than daytime (as defined above), including legal holidays
Noise	Any audible sound that has the potential to annoy or disturb humans, or to cause an adverse psychological or physiological effect in humans
Noise Level Measurements	Unless otherwise indicated, the use of A-weighted and "slow" response of instrument complying with at least Type 2 requirements of latest revision of American National Standard Institute (ANSI) S1.4 Specification for Sound Level Meters
Noise-sensitive Location	A location where particular sensitivities to noise exist, such as residential areas, institutions, hospitals, parks, or other environmentally sensitive areas
NSLU	Noise Sensitive Land Use
PCE	passenger car equivalent
PPV	peak particle velocity
Project	Otay Hills Project
QCB	Quino checkerspot butterfly
rms	root mean square
SANDAG	San Diego Association of Governments
SDG&E	San Diego Gas & Electric
sec	second
SEL	Sound Equivalent Level
SPL	Sound Pressure Level
SR	State Route
S_{WL}	Sound Power Level
TNM	Traffic Noise Level
USFWS	U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

The proposed Otay Hills Project (hereafter referred to as "Project" or "Proposed Project") is located in the unincorporated community of East Otay Mesa within the Otay Subregional Planning Area in the southernmost portion of San Diego County, approximately 2.5 miles north of the Otay Mesa Border Crossing. The Project site is located 8.5 miles east of the Interstate 805 (I-805)/State Route 905 (SR 905) interchange and 0.5 mile east of the intersection of Otay Mesa Road and Alta Road.

The Project applicant proposes to establish an aggregate recovery operation and associated activities on approximately 110 acres (known as the Project impact footprint) within the 438-acre Project site for approximately 120 years to fulfill rising demand in the south San Diego County market area. Aggregate recovery operations would be conducted through the use of drilling and blasting to fracture rocks. Six processing plants are proposed within the Project impact footprint: two materials processing plants (primary and secondary), a concrete batch plant, an asphaltic concrete plant, a cement-treated base plant, and a recycling plant. Following processing activities, the materials would be hauled off site by trucks. The export trucks would operate between the hours of 5:30 a.m. and 3:00 p.m. The trucks importing sand, cement and oil would operate 24 hours per day. The maximum trip generation calculations for the site are a total of 650 truck trips per day for operations and an additional 78 average daily traffic (ADT) associated with passenger (employee) vehicles.

The land within and adjacent to the Project site is zoned for rural residential and industrial uses, as well as conservation/limited use. The closest development to the Project site consists of a power plant and a concrete batch plant located immediately west of the impact footprint with the new Immigration and Customs Enforcement Otay Mesa detention center to the north of the power plant. The land adjacent to the remainder of the impact footprint is either graded (used for vehicle parking and storage or vacant), or undeveloped. There are three residences located approximately 1.3 miles away from the Project site along Otay Mesa Road (located at 6950 and 6980 Otay Mesa Road; Assessor's Parcel Numbers [APNs] 646-080-12 and 646-080-11).

In addition to the Proposed Project, five alternatives were analyzed: No Project/No Action Alternative, No Project/Existing Plan Alternative, Extraction to Natural Grade Alternative, Extraction to 50-foot Depth Alternative, and Extraction to 200-foot Depth Alternative. Under the No Project/No Action Alternative, there would be no construction aggregate extraction operation developed by the Project applicant on the Project site, and the Project site would remain as it is today, consisting of the undeveloped land crossed by a series of dirt roads used primarily by the U.S. Border Patrol for domestic security purposes. Under the No Project/Existing Plan Alternative, the 110-acre Project impact footprint would be developed as envisioned in the East Otay Mesa Specific Plan (EOMSP). Under the Extraction to Natural Grade Alternative, only Phases 1 and 2 of the Proposed Project would be implemented and the lifespan of this alternative would be approximately 20 years versus up to 120 years under the Proposed Project. Under the Extraction to 50-foot Depth Alternative, material would be extracted at approximately the same rate as the proposed Project for a period of 36 years to a maximum pit floor elevation of 530 feet above mean sea level (AMSL). Under the Extraction to 200-foot Depth Alternative, material would be extracted at approximately the same rate as the proposed Project for a period of 62 years to a maximum pit floor elevation of 380 feet AMSL.

The site is located within a relatively undeveloped area without substantial noise sources. The closest noise sources include those from traffic and the nearby Calpine energy plant. Alta Road is approximately 2,600 feet west of the site, and has an existing traffic volume of approximately 5,890 ADT between Calzada de la Fuente to Lone Star Road (Paseo de la Fuente) (Darnell & Associates 2017). In addition, two airports, Brown Field and the Tijuana International Airport, are located near the Project site. Brown Field is a general aviation airport and is in the City of San Diego approximately three miles west of the site. The Tijuana International Airport is in Tijuana, Mexico approximately three miles southwest of the Project site. Noise levels generated by both airports are below 60 decibels (dB) Community Noise Equivalent Level (CNEL) at the Project site. It should be noted that aircraft used by the U.S. Border Patrol periodically fly above the Project area, which also contribute to the existing noise environment.

The exterior usable space of the three existing houses along Otay Mesa Road would have noise levels above 60 dBA CNEL during Project maximum operation levels, which is above the County of San Diego's (County) threshold. These residences were built prior to any exterior-to-interior planning requirements. Based on the minimum exterior-to-interior planning structure noise reduction of 15 CNEL (presumed by Title 24 California Building Code minimum residential exterior to interior noise control), the interiors of these residences would probably have interior noise levels above 45 CNEL during maximum operation levels. Accordingly, traffic-related noise impacts to these three residences would be significant. Noise barriers in excess of 20 feet with returns on the residential properties to accommodate driveways would be required to fully mitigate impacts to the three affected residences along Otay Mesa Road.

The County of San Diego zoning ordinance 6708, Permitted Fences, Walls, Gates and Entry Structures, specifies that noise walls heights should not normally exceed 72 inches in height for backyard walls and 42 inches for front yard walls. The County normally permits walls to be planned as berm wall combinations up to nine feet in height (which is probably not feasible at these residences). The construction of noise walls to the requisite height to control the noise from heavy truck traffic immediately adjacent to the roadway would require walls significantly higher than specified above. Therefore, this mitigation, while feasible, would probably not be permitted by the County of San Diego and is unlikely to be desired by the residents of the houses. Residents may request the construction of shorter noise walls in front of their property; however, the walls would not fully mitigate impacts. Accordingly, impacts are conservatively assessed as significant and unmitigated.

In addition, based on ambient growth and future development expected in the region, significant cumulative noise impacts to the three residences would occur regardless of whether or not the Project is implemented. The Project would raise the noise levels at all houses to above 75 CNEL, a level which is generally defined as unacceptable for residential land use.

If residences were to be developed within 385 feet of the Project impact footprint area of current or future planned extraction, noise impacts from the Project could be significant. It should be noted that this rural residential development represents a conservative scenario in that other types of development that may be constructed adjacent to the Project impact footprint (e.g., commercial, industrial) have higher noise thresholds (refer to Table 4).

However, it should be noted that many adjacent parcels are 20-acre lots, and are unlikely to be subdivided for residential use based on the new 2020 County planning guidelines. As such, the lots all have more than 10 acres of land suitable for exterior use at less than 60 CNEL even when excavation is occurring adjacent to the property line. As noted above, if excavation occurs within 72 feet of a property line, a 10-foot-high noise control barrier would be required to control noise to less than 75 dBA L_{EQ}. This is not a permanent noise control barrier; it is only a temporary requirement for excavation within 72 feet of an occupied residential land use. The barrier does not have to extend for the full property line length, it only needs to break the line of sight for any operational locations for a distance of 72 feet from the equipment to the property line. With the installation of a 10-foot high noise barrier as described, the property line noise impacts would be less than 75 dBA L_{EQ}.

The on-site non-transportation noise sources would generate noise in excess of the 60 dBA L_{EQ} threshold for sensitive wildlife species throughout much of the Project impact footprint periphery. A mitigation measure (MM 3.4.3f) for potentially significant impacts to sensitive wildlife species is presented in the Biological Technical Report for the Proposed Project (HELIX 2016).

In summary, potential significant noise impacts to future residential development adjacent to the Project impact footprint, as well as potential significant noise impacts to sensitive wildlife species, would be mitigated to less than significant levels. However, noise impacts to the three existing residences located along Otay Mesa Road would be significant and unmitigated.

Under the No Project/No Action Alternative, no construction or operational noise impacts would occur. However, other non-project construction noise impacts associated with the No Project/Existing Plan Alternative would be substantially greater than the Proposed Project due to the development of useable residential and industrial lots and access streets. Traffic-related noise associated with the No Project/ Existing Plan Alternative would be greater than that of the Proposed Project because this alternative would result in greater buildout traffic volumes than the Proposed Project. Noise generated on-site, however, would be from the planned Mixed Industrial and Rural Residential land use which would typically be substantially less than that generated by the Proposed Project.

Construction and operational noise impacts, and operational noise mitigation associated with the Extraction to Natural Grade Alternative, Extraction to 50-foot Depth Alternative, and Extraction to 200-foot Depth Alternatives would be approximately the same as the Proposed Project.

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1.0 INTRODUCTION

1.1 Project Location and Description

1.1.1 Project Location

The proposed Otay Hills Project (hereafter referred to as "Project" or "Proposed Project") is located in the unincorporated community of East Otay Mesa within the Otay Subregional Planning Area in the southernmost portion of San Diego County, approximately 2.5 miles north of the Otay Mesa Border Crossing. The Project site is located 8.5 miles east of the Interstate 805 (I-805)/State Route (SR) 905 interchange and 0.5 mile east of the intersection of Otay Mesa Road and Alta Road. Refer to Figure 1 for the regional location. Figure 2 is an aerial photograph of the Project site and surrounding vicinity. As noted on Figure 2, the Project site extends north and east of the Project impact footprint.

1.1.2 Project Description

The Project applicant proposes to establish an aggregate recovery operation and associated activities on approximately 110 acres (known as the Project impact footprint) within the 438-acre Project site (Figures 2 and 3) for approximately 120 years (including final backfill) to fulfill rising demand in the south San Diego County market area. Such an operation would require a Major Use Permit (MUP) from the County of the San Diego (County).

Rock that has been processed for use in manufacturing other products (such as concrete or asphaltic concrete) is typically referred to as aggregate. Aggregates are necessary for the construction of new homes and supporting infrastructure. Anticipated operations on the 110-acre Project impact footprint would include phased recovery of rock resources and materials processing. Following completion of resource recovery operations, the Project impact area would be reclaimed to a beneficial land use consistent with the underlying land use regulations. The aggregate extraction operation would occur on an approximate 94-acre area while processing activities would take place on an approximate 16-acre pad at the northern portion of the proposed site (for a total of 110 acres). Figure 4 provides a detailed plan of the equipment area.

Aggregate recovery operations would be conducted through the use of drilling and blasting to fracture rocks. A single drill rig would be used to drill a pattern of bore holes 3 to 6 inches in diameter. Typically, the pattern is laid out in a 60- by 120-foot grid with 45-foot deep holes. A contractor then loads the holes with carefully metered explosives. The "shot" is timed to detonate each hole in sequence. This minimizes the ground vibration and noise of the blast, while maximizing fracture of the rock. Some dust is created as a result of the blast; however, the dust would be fully dissipated within 30 to 60 seconds following the shot. The rock would be broken up to sizes less than 18 inches in diameter. Blasting would occur approximately once per week. Production levels of 600,000 to 1,600,000 tons per year are anticipated. Blasting operations would be conducted by a licensed blasting contractor with all blasting materials transported to the site for each blasting sequence. No explosives would be stored at the site. Following blasting, the rock resource would be fractured and could be moved with conventional earth-moving equipment. A front-end loader would be used to load off-highway rock trucks for transport of fractured rock to the primary processing plant located on site.

Processing Plants

Six processing plants are proposed within the Project impact footprint: two materials processing plants (primary and secondary), a concrete batch plant, an asphaltic concrete batch plant, a cement-treated base plant, and a recycling plant.

Primary Plant

The primary plant is loosely defined as the process that takes the raw material and crushes it to a size suitable for further processing and screening. Typically, a primary plant would crush the rock, screen out unusable fine materials, and deposit the crushed rock in a surge pile for use by the secondary plant. The primary plant is independent of the secondary plant and can be used without operating the secondary plant. It is anticipated that the primary plant would consist of a jaw crusher, a scalping screen, a secondary cone crusher, and two material stackers. Depending upon distance from the primary processing plant, it may be feasible to utilize a remote jaw crusher and overland conveyor to move materials to the secondary processing plant.

The primary plant would be initially located in the 16-acre processing plant area (shown on the site plans). As the excavation progresses in the 94-acre active quarry portion of the Project footprint (probably in the Phase 2c or Phase 3 [described in detail below]) and the quarry reaches near level or sub-grade level to the secondary plant, the primary plant may be relocated into the extraction area for convenience in materials handling. This location is variable, and the primary plant may be relocated several times during the active mining phase(s) of the project. A conveyor system would be used to transport the primary processed materials to the secondary plant.

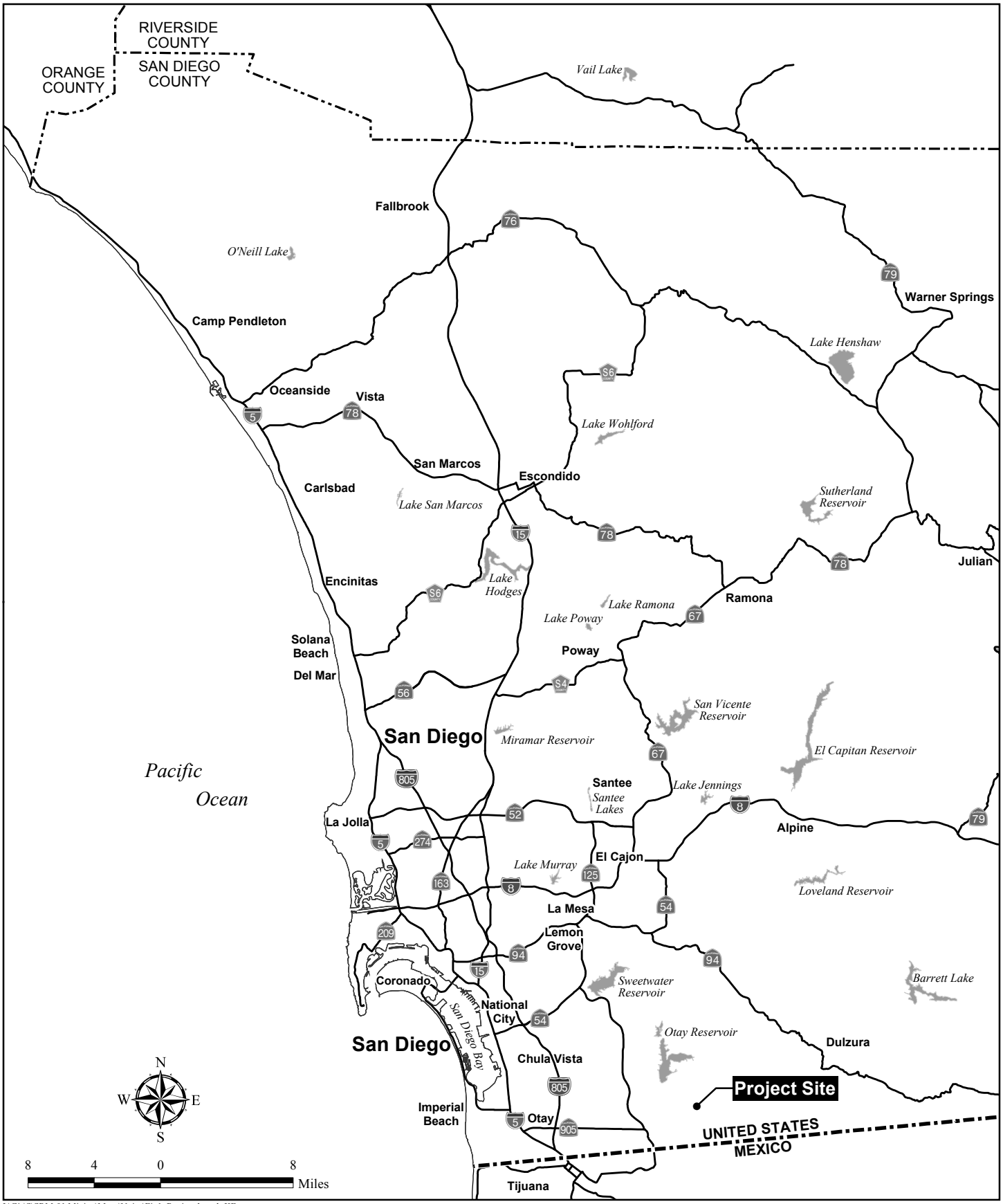
Assumptions:

1. The first move would not occur until the general relocation area for the crusher reaches an approximate all "natural grade" (or lower) as defined in Phase 2 below with the crusher raw materials feed area and the top of the crusher mounted in an area below the "natural grade" so that all portions of the unit which may create noise are at or below the "natural grade".

2. As described in Section 5.4, *Design Considerations and Mitigation Measures*, below, no crusher would be relocated (after being set in the initial project described configuration) closer than a minimum 350-feet to any site property line

Secondary Plant

The secondary plant would consist of multiple crushers to further reduce the size of the rock, and multiple screens to sort the material by size, and a washer to clean dirt from certain types of material to meet end product specifications. The crushing and screens would include a cone crusher to create reduce aggregate sizes and several impactor crushers to create manufactured sand. Materials washing in the screening process would require a final water removal screw and construction of a pond to recycle and store water. Front-end loaders would be needed only to load trucks.



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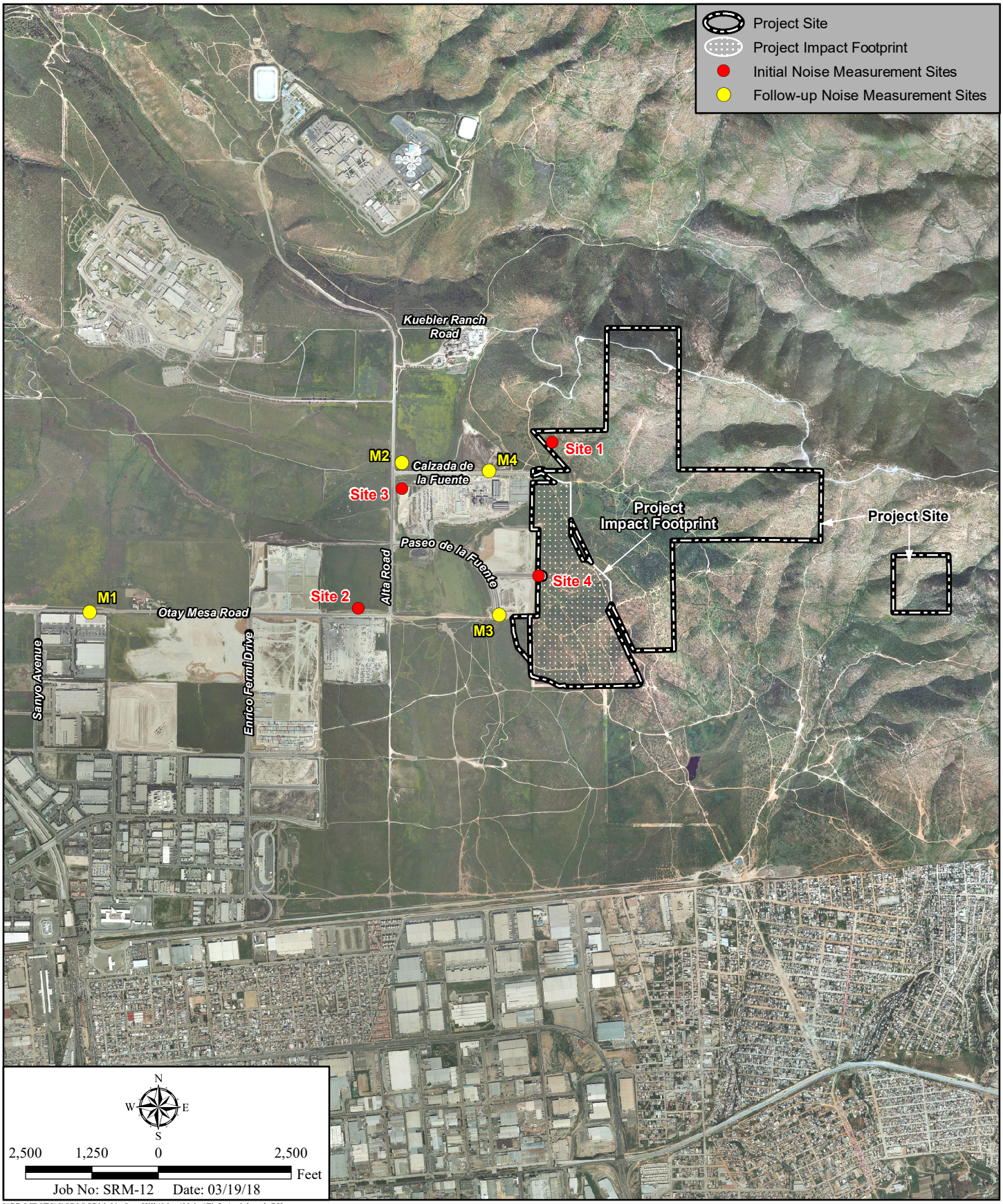
Regional Location Map

OTAY HILLS

HELIX Environmental Planning

Figure 1



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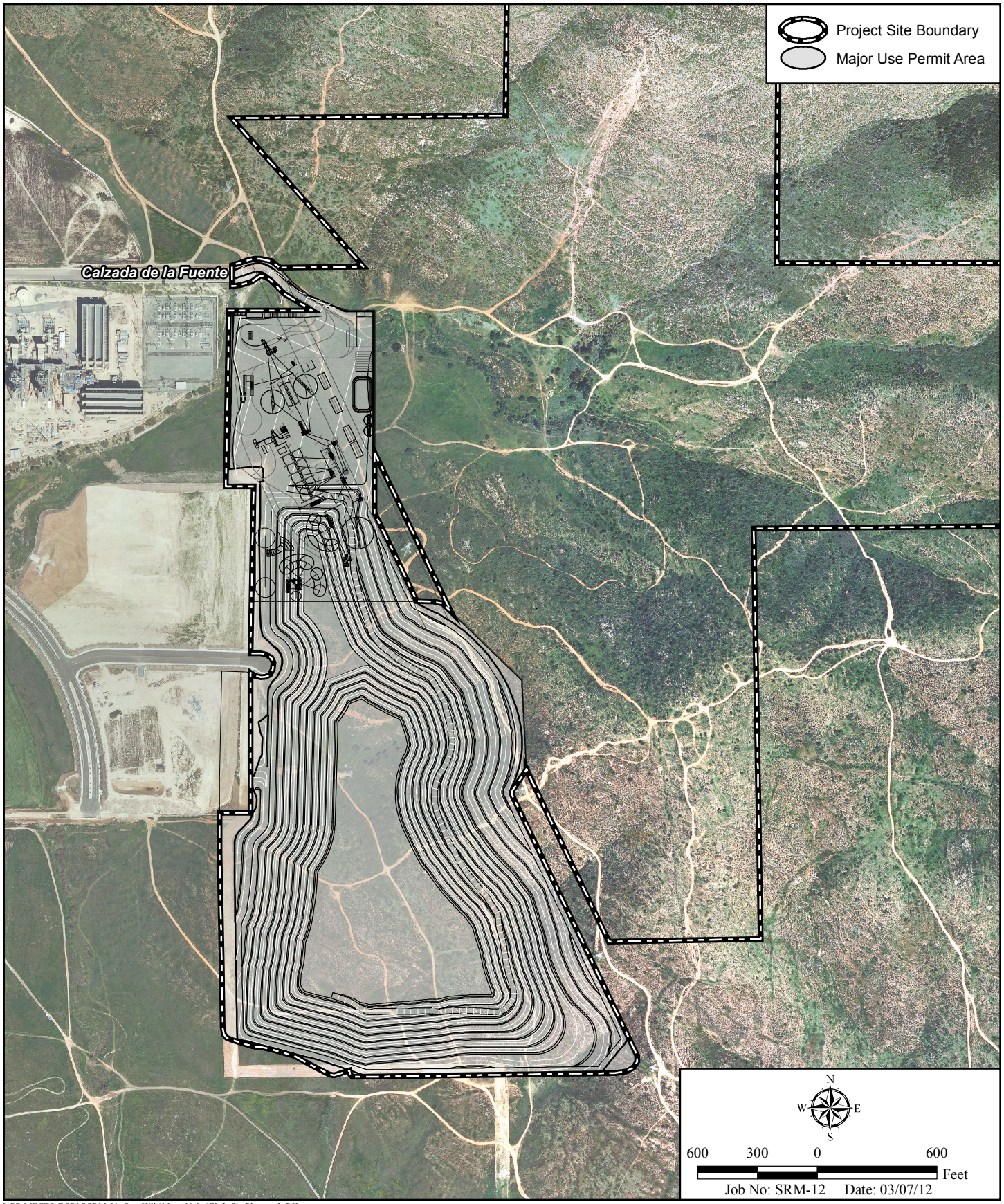
Aerial Photograph

OTAY HILLS

HELIX Environmental Planning

Figure 2



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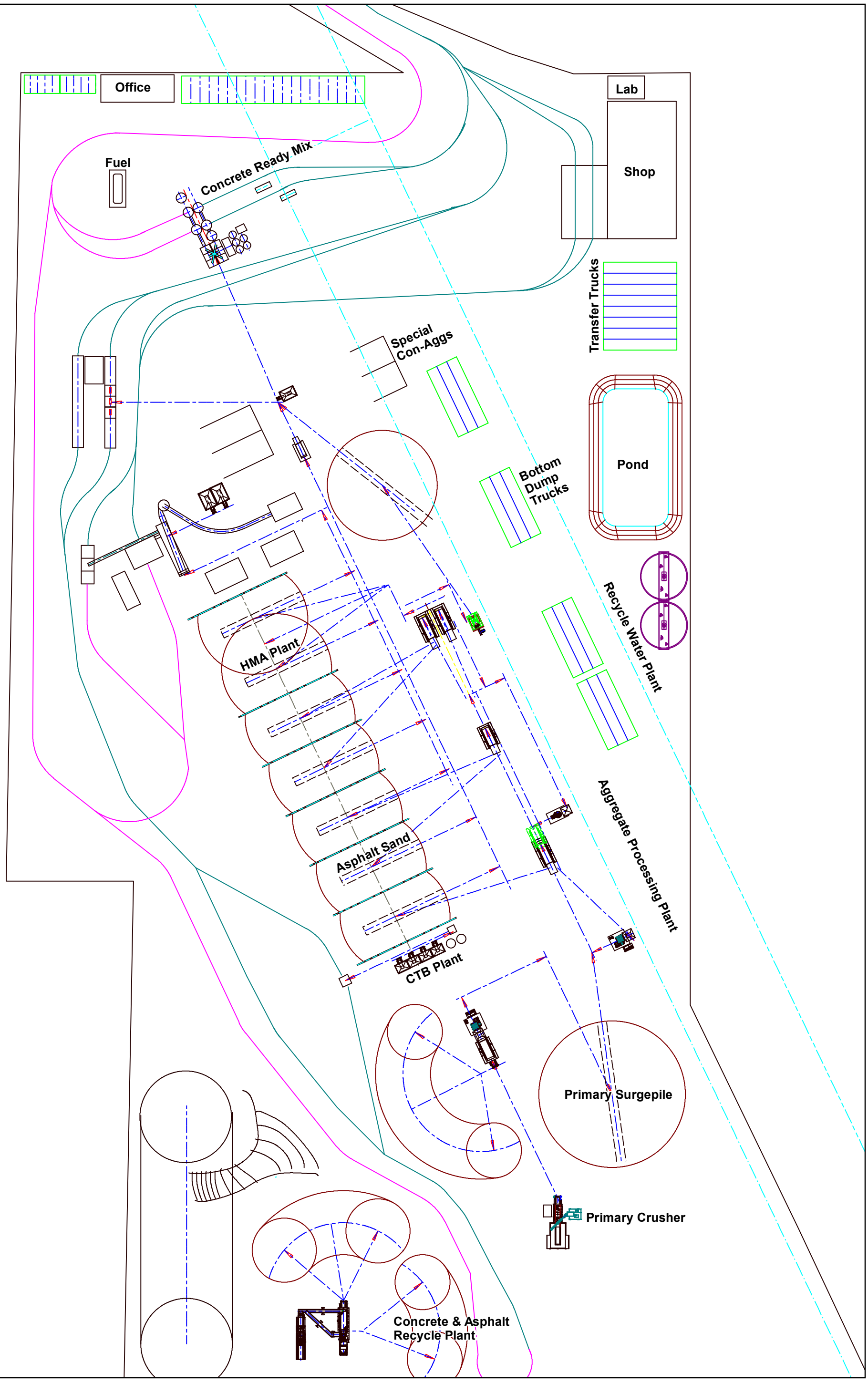
Project Site Plan

OTAY HILLS

HELIX Environmental Planning

Figure 3



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Proposed Facilities Layout

OTAY HILLS

HELIX Environmental Planning

N 0 100 Feet

Figure 4

Finished aggregate would be stockpiled and/or stored in overhead loading bins. The stockpiles would be approximately 35 feet in height. The aggregate would then be loaded onto trucks either with a front-end loader or by gates on the bottom of overhead loading bins. Prior to leaving the extraction area, loaded trucks would be top-watered to prevent roadway dust and would pass across a scale to determine the total weight of the truck and identify the type and weight of the aggregate.

Concrete Batch Plant

The concrete batch plant would likely be set up so that materials could be conveyed directly from the aggregate stockpiles to the concrete batch plant. Within this plant, appropriate quantities of aggregate of various types, cement, and water would be weighed to make up batches of concrete. These materials are then discharged into a mixer drum on a ready-mix concrete truck. A concrete batch plant is relatively quiet.

Asphaltic Concrete Plant

The asphaltic concrete plant would be sited such that materials could be conveyed from the aggregate stockpiles for direct loading of the asphalt plant by conveyor. The asphalt plant would discharge the various types of aggregate into a large rotating drum, where the aggregate is heated to drive off water. The heated materials are then mixed with asphalt in a pug mill to make asphaltic concrete. This type of plant is relatively quiet as well.

Cement Treated Base Plant

A cement treated base plant would be located within the Project site. Cement-treated base is a rock/sand mixture that has been mixed with cement powder to provide improved strength and stability for highway and foundation projects.

Recycling Plant

A concrete and asphaltic concrete recycling plant also would be included as part of the proposed Project. This process would involve the import of used concrete and asphalt materials, crushing, and exporting for use as road base or a foundation material. These materials may also be blended with rock originating from the site to improve the performance characteristics.

Office Buildings

Buildings associated with the aggregate plant would likely include a modular office building and a small-scale truck weighting scale building, and a small maintenance shop. These facilities would be located near the secondary plant. Site operations would likely employ approximately 10 to 15 people. On-site parking would be required.

Phasing

The Proposed Project would consist of site preparation for the processing plant equipment and a phased extraction and backfilling operation. Ongoing backfilling of the site during the open pit extraction phase of the Project would allow reclamation to progress concurrently with the extraction operation. The project timeline includes the following phases of development:

- Phase 1: Site Preparation
- Phase 2: Extraction to Natural Grade Elevation
- Phase 3: Open Pit Extraction
- Phase 4: IDEFO (Landfill)

Phase 1 – Site Preparation

Phase 1 involves site preparation activities prior to mining including initial grading to establish access routes, extending water and power service to the site, and grading pad areas for the processing plant location. Site preparation operations would be located in the northern portion of the site. Phase 1 grading consists of minor cutting of the landform to create a relatively flat working surface for the processing plant. Construction of the processing plant, concrete batch plant, asphalt plant, cement treated base plant, and site office would also be commenced. This initial phase would include 14.8 acres on the Project site, plus associated activities required to construct the access road. Ultimately, the processing area would also extend into the northern portion of Phase 2 and consist of 16.1 acres. Activities in Phase 1 are expected to continue for about one year.

Phase 2 – Extraction to Natural Grade Elevation

Phase 2 would involve commencement of extractive operations within the extraction footprint. This phase is divided into three sub phases, with Phase 2a occurring in the north and ending with Phase 2c in the south. Phase 2 would consist of cutting the landform to the natural grade elevation that exists along the western perimeter of the site. The natural grade elevation of the mesa (west of the site) ranges between 580 and 650 feet above mean sea level (AMSL).

During Phase 2a, aggregate resources would be recovered immediately adjacent to the Phase 1 area and over a 19.2-acre area of the site. Extractive operations in Phase 2a are expected to remove 4.8 million tons and would continue for approximately 5 years depending on the demand for aggregate resources. As aggregate resources are depleted from Phase 2a, extraction operations would transition into Phase 2b.

Phase 2b operations would include extraction of material from a 27.7-acre area and is expected to continue for approximately 6 years depending on the demand for aggregate resources. This phase is expected to remove 5.4 million tons of material.

Phase 2c operations would begin as extraction operations are completed within Phase 2b. Phase 2c would consist of extracting 10.9 million tons of material from the remainder of the extraction footprint (45.8 acres). Phase 2c is expected to continue for approximately 11 years depending on the demand for aggregate resources.

As operations progress in Phase 2, slope areas within Phase 1 and Phase 2 would be seeded with a non-invasive erosion control mix. Prior to seeding, topsoil that is removed ahead of extractive operations would be reapplied to slope areas where conditions allow. A portion of the slopes that are seeded along the eastern perimeter of the pit would be used as a biological buffer adjacent to sensitive environmental habitats proposed to be set aside by the Project to the east of the proposed extractive operations. A native seed mix would be used for these areas.

Phase 3 – Open Pit Extraction

As Phase 2 is completed, mine operations would continue to Phase 3. Like Phase 2, Phase 3 is divided into sub phases. Phases 3a through 3d would also progress in a north to south direction. Extraction operations that would occur during Phases 3b through 3d would extend to a maximum depth of approximately 525 feet from the existing grade (or approximately 700 feet from the top of eastern cut slope), unless groundwater (not stormwater) is encountered in the pit. If groundwater is encountered, excavation would halt at that elevation and reclamation would begin within a year. As part of the reclamation process, the site would be utilized as an IDEFO. Backfilling is expected to continue throughout the Phase 3 operations, on a phase-by-phase basis.

The Phase 3a operations would involve additional extraction of material from an 8.5-acre area that would extend below the finished grade to form a sub-grade depression. Phase 3a extraction operations would extend below the Phase 2a area and would have a maximum depth of approximately 285 feet from the existing grade (or 415 feet from the top of eastern cut slope). This phase is expected to remove 3.3 million tons and would continue for approximately 3 years depending on the demand for aggregate resources. As extraction operations advance in Phase 3a and space becomes available, backfilling of the Phase 3a sub-grade depression would commence. Inert fill material would be used to backfill the depression.

Phase 3b operations would consist of extracting 16.1 million tons of material from a 22.1-acre area, over approximately 16 years depending on the demand for aggregate resources.

It is anticipated that Phase 3c would extract 17.9 million tons of material from a 22.1-acre area, over approximately 18 years depending on the demand for aggregate resources. Phase 3d operations are expected to extract 30.7-million tons from a 33.7-acre area, over approximately 31 years (±1 year) depending on the demand for aggregate resources.

Phase 4 – Inert Debris Engineered Fill Operation (Landfill)

As extraction operations advance in Phase 3, the pit would be backfilled with inert fill material (fill dirt) on a phase by phase basis. Phase 4a would consist of backfilling a portion of the Phase 3a pit area. It is anticipated that this would require 2.6 million tons of imported fill material and would take approximately six years to complete. Phase 4b would involve backfilling the remainder of Phase 3a and portions of Phases 3b, 3c, and 3d. This would be followed by Phase 4c, which would backfill the remainder of Phase 3b and continue to backfill portions of Phase 3c and 3d. Phases 4d and 4e operations would include backfilling the remainder of Phases 3c and 3d. Table 2-3, *Extraction/Backfilling Summary for Phases 1 through 4*, provides a summary of the individual extraction and backfilling phases that would occur during the Project.

The assumptions used above include an average annual production of one million tons. The rate of backfill is estimated at 500,000 cy per year. This backfill rate was determined by studying backfill rates at other sites in San Diego County. A cross-sectional overview of the extraction and backfilling phases is provided in Figures 2-3 through 2-8. Figure 2-9, *Final Site Plan Extraction*, shows the final extraction configuration and easements.

Throughout the phased mine plan, fill material that is used for backfilling would be compacted to form pad areas. All fill material would be inspected upon arrival to ensure that contaminated soils or garbage are not present. All backfilling operations would be supervised by a geotechnical engineer to ensure that the fill materials are adequately compacted to satisfy the needs of the post mining land use.

There are a limited number of landfills that accept fill materials in San Diego County. Inert fill material is produced from a variety of sources, but typically is a by-product of sub-grade excavations for parking garages or development that results in export of naturally occurring soil. In addition, clean demolition materials from redevelopment projects need to be placed in an inert fill materials site.

Where inert landfills are unavailable in the local community, these fill materials must be disposed of in local sanitary landfills or hauled to locations where fill receiver sites are available. Aggregate production sites hold the greatest potential for accepting a relatively large quantity of fill materials. There are a number of mining operations throughout southern California that utilize inert fill material to backfill and compact the mining void in order to reclaim the site to useable land. Depending on the rate at which fill material is imported to the site, it is anticipated that Phase 4 activities would continue for approximately 67 years throughout the extraction operation. Phase 4 operations are anticipated to continue for approximately 16 years beyond extraction operations.

Post-extraction (Reclamation) Activities

Upon completion of each phase, reclamation would commence. Although reclamation would occur in each phase as recovery operations are concluded, these activities would be similar on all areas of the site. Final reclamation would occur when all recovery operations have been completed. These activities would include final grading to establish the final land form, removal of plant equipment, application of topsoil resources, and revegetation.

Following completion of all recovery operations, all processing and operating equipment would be removed from the site unless this equipment would continue to be used following reclamation.

Reclamation of slope areas would involve replacement of topsoil in some areas. Salvaged topsoil would be stockpiled for use with revegetation. Where conditions allow, topsoil would be reapplied to some slope areas. However, due to steep final slopes and hard rock exposures, revegetation may not be practical in some areas.

Pad areas would be treated with appropriate erosion control measures to stabilize the site against accelerated erosion and sedimentation. The site would be managed in this manner until an appropriate land use is identified for this site.

Portions of the slopes and a portion of the Phase 2 pad area would be prepared for seeding as a biological buffer adjacent to sensitive biological habitats proposed to be set aside by the Project to the east of the proposed extractive operations. A fence would be placed along the outside edge of extraction areas during construction for safety and security reasons. The fence also would help keep people out of the adjacent proposed open space.

1.1.3 Project Alternatives

In addition to the Proposed Project, three alternatives were analyzed: No Project/No Action Alternative, Extraction to Natural Grade Alternative, and Varying Depth Alternative with extraction between 50-foot to 200-foot Depth. A brief description of each alternative is provided below.

No Project/No Action Alternative

Under the No Project/No Action Alternative, no construction aggregate extraction operation or IDEFO developed by the Project Applicant would occur on the Project site. The Project site would remain as it is today, consisting of the undeveloped land crossed by a series of dirt roads used primarily by the U.S. Border Patrol for domestic security purposes. No changes in the existing environment would be expected.

Extraction to Natural Grade Alternative

This alternative would include only Phases 1 and 2 of the Proposed Project as described previously in Section 2.3.1.2, *Phasing*. The impact footprint would be the same; however, the aggregate would only be extracted to natural grade elevation and the lifespan of this alternative would be approximately 20 years versus up to 120 years for the Proposed Project (Figure 2-12, *Extraction to Natural Grade Alternative*). Approximately 19 million tons of aggregate would be extracted under this alternative versus 89.2 million tons under the Proposed Project. Annual production amounts are anticipated to be similar to the Proposed Project (i.e., between 0.6 and 1.6 million tons of aggregate per year). The operational characteristics would be the same as described for Proposed Project; however, the IDEFO (inert landfill) would not be included since the deep pit associated with Phase 3 of the Proposed Project would not occur.

Similar to the Proposed Project, the proposed construction aggregate operation would be developed in phases. The timing for Phases 1 and 2 could change in the future depending upon aggregate needs in southern San Diego County, such that the phases presented herein could change and/or more than one phase could be in use at any one time

Extraction to Varying Depth Alternative

The Extraction to Varying Depth Alternative would include the same operations and footprint as the Proposed Project (Figures 2-13a and 2-13b, *Extraction to Varying Depth Alternative*), except that the ultimate pit depth would be reduced from approximately 525 feet below the existing grade (under the Proposed Project) to a shallower depth. This alternative would result in a final extraction depth between 50 and 200 feet below the existing grade and would consist of four phases. These phases would be consistent with Phases 1 through 4 of the Proposed Project. Phase 1 would include site preparation and the construction of the processing plant. Phase 2 would consist of cutting the landform to the natural grade elevation that exists along the western perimeter of the site. The natural grade elevation of the mesa (west of the site) ranges between 580 and 650 feet AMSL. Extraction would progress in a north to south direction. Extraction operations during Phase 3 would extend below the Phase 2 area, to a maximum pit floor elevation of 380 to 530 feet AMSL, depending on the final depth of extraction. Phase 4 would involve backfilling the pit with inert fill

material and compacting the material to form pad areas (IDEFO). Similar to the Proposed Project, the pit would be backfilled consecutively with extraction that occurs during Phase 3.

The total anticipated production of the quarry under this alternative would have an estimated life of 36 to 60 years and would extract approximately 35 to 60 million tons of mineral resource from the site, depending on the final depth of extraction. Annual production amounts are anticipated to be similar to the Proposed Project (i.e., between 0.6 and 1.6 million tons of aggregate per year).

Similar to the Proposed Project, the proposed construction aggregate operation would be developed in phases. The timing for Phases 1 through 4 could change in the future depending upon aggregate needs in southern San Diego County, such that the phases presented herein could change and/or more than one phase could be in use at any one time.

1.2 Environmental Setting and Existing Conditions

1.2.1 Setting and Location

The Project site is located at the eastern extension of Otay Mesa on the southwestern flank of the San Ysidro Mountains. Surrounding uses include undeveloped land, industrial uses, a new detention facility, and scattered rural residential uses. The closest development to the Project site consists of a power plant and a concrete batch plant located immediately west of the impact footprint and the new Immigration and Customs Otay detention facility to the north of the power plant. The land adjacent to the remainder of the impact footprint is either graded (used for vehicle storage or vacant), or undeveloped. Areas approximately 2.5 miles south of the Project site are industrial portions of Tijuana, Mexico. Two prison facilities, the R.J. Donovan State Correctional Facility and the George F. Bailey County Detention Facility, are located approximately three miles north of the Project site.

The Project site is currently undeveloped, with the exception of a few dirt roads that transect the site. A 150-foot San Diego Gas & Electric (SDG&E) easement containing power lines extends diagonally through the Project site. SDG&E utility towers (230 kilovolts [kV]) are located along the eastern perimeter of the extraction footprint. A 20-foot wide natural gas pipeline easement that was formerly within or parallel to the noted SDG&E easement has been relocated, and now extends generally parallel to the western and southern boundaries just inside the Project impact footprint.

Two peaks and several canyons, including one large canyon, exist within the Project site. The largest canyon on site contains the lowest site elevation, approximately 620 feet AMSL, along the western Project boundary. This canyon flows via an unnamed drainage westward through the Project site, and turns southward just beyond the Project boundary. The southern slopes of this canyon rise to the highest point on the Project site, at 1,020 feet AMSL. This peak occurs within the southeastern portion of the Project site; a neighboring small peak, approximately 720 feet AMSL occurs at the southwestern corner of the Project site. The northern and eastern slopes of the canyon rise into the San Ysidro Mountains bordering the Proposed Project to the north and east. Approximately 22 acres of slopes steeper than 25 percent occur on the Project site. These slopes are mainly associated with the hill and canyon slopes, rather than the valleys or peaks.

1.2.2 Noise Sensitive Land Uses

The County guidelines identify any residence and other typically human-occupied indoor area, and residential outdoor use area as Noise Sensitive Land Uses (NSLUs). The land within and adjacent to the Project site is zoned for rural residential and industrial uses, as well as conservation/limited use. In addition, there is some land to the west of the site designated as technology business park. The closest residence to the Project impact footprint is located along Kuebler Ranch Road approximately 2,200 feet northwest of the Project boundary. This location is shielded from a direct view of the Project by the ridgeline running east to west beyond the northern project footprint. The location would have impacts well below significant levels and is not further considered. There also are three residences located approximately 1.3 miles away from the Project site along Otay Mesa Road, however, that may be affected by Project implementation.

No on-site land uses are considered NSLUs during construction or operation of any proposed project. Any potential noise impacts would therefore be limited to off-site land uses.

1.2.3 Sensitive Habitat

The site and surrounding area includes Diegan coastal sage scrub (including disturbed), coastal sage-chaparral scrub, chamise chaparral, southern mixed chaparral, non-native grassland, and disturbed habitat. The Proposed Project would directly impact the federally listed endangered Quino checkerspot butterfly (QCB) and QCB critical habitat, federally listed threatened California gnatcatcher (CAGN) critical habitat, Otay tarplant and Otay tarplant critical habitat, and several other sensitive plant and animal species. Indirect noise impacts to 14.7 acres of Diegan coastal sage scrub also would occur (HELIX 2016).

1.2.4 Existing Noise Conditions

The site is located within a relatively undeveloped area without substantial noise sources. The closest noise sources include those from traffic and the Calpine energy plant. Alta Road is approximately 2,600 feet west of the site. In addition, two airports, Brown Field and the Tijuana International Airport are located near the Project site. Brown Field is a general aviation airport and is in the City of San Diego approximately three miles west of the site. The Tijuana International Airport is in Tijuana, Mexico approximately three miles southwest of the Project site. Noise levels generated by both airports generate are below 60 decibels (dB) Community Noise Equivalent Level (CNEL) at the Project site. It should be noted that aircraft used by the U.S. Border Patrol periodically fly above the Project area, which also contribute to the existing noise environment.

1.3 Terminology, Methodology and Equipment

1.3.1 Noise Measuring Methodology and Procedures

Terminology

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Frequency, Sound Pressure Levels and Decibels

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this huge range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing (i.e., the faintest audible noise) for young people is about 0 dB, which corresponds to 20 mPa.

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

Metrics

All noise level or sound-level values presented herein are expressed in terms of decibels with A-weighting, abbreviated "dBA," to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol "L_{EQ}." L_{EQ} represents an average of the sound energy occurring over a specified period. In effect, L_{EQ} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. Unless a different time period is specified, L_{EQ} implies a period of one hour. Some of the data also may be presented as octave-band-filtered and/or A-octave-band-filtered data, which are a series of sound spectra centered about each stated frequency, with half of the bandwidth above and half of the bandwidth below each stated frequency. These data are typically used for machinery noise analysis and barrier-effectiveness calculations.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency (pure-tone) signals in the mid-frequency (1,000 to 8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness.

No known studies have directly correlated the ability of a healthy human ear to discern specific levels of change in traffic noise over a 24-hour period. However, many ordinances, such as the City of San Diego, specify a change of 3 CNEL as the significant impact threshold based on the concept that a 3-dBA change is the smallest audible difference perceptible by the human ear.

The CNEL is a 24-hour average A-weighted hourly sound level for a given day, after addition of 5 dB to sound levels for the evening hours of 7:00 p.m. to 10:00 p.m., and 10 dB to sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. CNEL is used to evaluate transportation noise sources. The result of this weighting is that noise produced during the evening and nighttime hours is factored in more significantly due to its disruption of an otherwise peaceful time of the day. These data unit metrics are used to express noise levels for both measurement and municipal noise ordinances and regulations, land use guidelines, and enforcement of noise ordinances.

To create an overall 3-dBA change in traffic noise, the traffic volume must double while maintaining the same speed.

Noise emission data is often supplied per the industry standard format of Sound Power Level (S_{WL}), which is the total acoustic power radiated from a given sound source as related to a reference power level. Sound Power differs from Sound Pressure, which measures the fluctuations in air pressure caused by the presence of sound waves, and is generally the format that describes noise levels as heard by the receiver. Sound Pressure is the actual noise experienced by a human or registered by a sound level instrument. When Sound Pressure is used to describe a noise source, it must specify the distance from the noise source to provide complete information. Sound Power is a specialized analytical method to provide information without the distance requirement, but it may be used to calculate the sound pressure at any desired distance.

Measurement Methodologies

Typically, a "one-hour" equivalent sound level measurement (L_{EQ}, A-Weighted) is recorded for at least one noise-sensitive location on the site. During the on-site noise measurement, start and end times are recorded and vehicle counts are made for cars, medium trucks (MT) and heavy trucks (HT) for the corresponding road segment(s). Supplemental sound measurements of one hour or less in duration are often made to further describe the noise environment of the site.

For measurements of less than one hour in duration, the measurement time is long enough for a representative traffic volume to occur and the noise level (L_{EQ}) to stabilize; 15 minutes is usually sufficient for this purpose. The vehicle counts are then converted to one-hour equivalent volumes by using the appropriate multiplier. Other field data gathered include measuring or estimating distances, angles-of-view, slopes, elevations, roadway grades, and vehicle speeds. These data were checked against the available maps and records.

The following equipment was used to measure existing noise levels:

- Larson Davis System LxT Integrating Sound Level Meter
- Larson Davis Model CA250 Calibrator
- Windscreen and tripod for the sound level meter
- Digital camera

The sound level meter was field-calibrated immediately prior to each noise measurement to ensure accuracy. All sound level measurements conducted and presented in this report, in accordance with the regulations, were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2001). All instruments are maintained with National Bureau of Standards traceable calibration, per the manufacturers' standards.

1.3.2 Noise Modeling Software

Traffic Noise Model

The Traffic Noise Model software, (TNM) Version 2.5, released in February 2004 by the U.S. Department of Transportation, was used for all traffic modeling in the preparation of this report. TNM calculates the daytime average Hourly Noise Level (HNL) from traffic data including road alignment, elevation, lane configuration, projected traffic volumes, estimated truck composition percentages, and vehicle speeds. Hard surface noise attenuation is used in the analysis.

The model-calculated noise output is the one-hour L_{EQ}. This is equivalent to CNEL, with the use of 8 to 10 percent of the average daily traffic (considered to represent peak hour traffic; Caltrans Technical Noise Supplement, September 2013).

Computer Aided Noise Abatement (CADNA)

Modeling of the outdoor noise environment was accomplished using Computer Aided Noise Abatement (CADNA) Ver. 2017, which is a model-based computer program, developed by DataKustik for predicting noise impacts in a wide variety of conditions. CADNA assists in the

calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of Project information (e.g., noise source data, barriers, structures, and topography) to create a detailed computer model, and uses the most up-to-date calculation standards to predict outdoor noise impacts.

1.3.3 Noise Measurements and Calculations

Noise measurements were conducted at the Project impact footprint and along Alta Road and Otay Mesa Road to determine the existing noise levels at the site and nearby potential Project haul roads.

Noise measurements were conducted on May 24, 2005. The noise measurement locations are depicted as Sites 1 through 3 on Figure 2. Site 1 was located at the northwestern portion of the Project impact footprint. Sites 2 and 3 were adjacent to Otay Mesa Road and Alta Road, respectively. Noise measurement Sites 2 and 3 had a direct line-of-sight view to the adjacent roads. The measured average noise levels were 40 dB L_{EQ} at Site 1, 70 dB L_{EQ} at Site 2 and 66 dB L_{EQ} at Site 3. The measured average noise levels and concurrent traffic volumes are shown in Table 1. As noted, the measured noise levels are in terms of the average sound level during the noise measurement period.

Table 1
INITIAL MEASURED NOISE LEVELS AND TRAFFIC VOLUMES

Site	Description	Date Time	dBA L_{EQ}	Cars	Medium Trucks	Heavy Trucks
1	Northwest Portion of the Project Impact Footprint	5/24/2005 8:40 to 8:55 a.m.	40	-	-	-
2	45 feet to Centerline of Otay Mesa Road	5/24/2005 7:00 to 8:00 a.m.	70	535	8	21
3	50 feet to Centerline of Alta Road	5/24/2005 8:10 to 8:30 a.m.	66	84	1	4

A follow-up site visit was made on December 3, 2007 at 4:00 p.m. A site noise measurement was taken at the edge of the Project impact footprint south of the Calpine energy plant. The measured noise level for a 15-minute period was 52.4 dBA L_{EQ}. The only audible noise was from temporary pipeline construction occurring approximately 300 yards south of the measurement site.

During the follow-up visit on September 19, 2011, noise measurement updates were conducted. The noise measurement locations (M) are depicted as M1 through M4 on Figure 2. M1 is located near the western end of the segment of Otay Mesa Road between Sanyo Avenue and Enrico Fermi Drive. M2 is located at the intersection of Alta Road and Calzada de la Fuente. M3 is located at the dead-end of Paseo de la Fuente near the southwestern corner of the Project site. M4 is located on Calzada de la Fuente directly across from the power plant. All measurement locations have a direct line-of-sight view to the adjacent roads, and M4 has a direct line-of-sight view to the loudest power plant noise sources.

The measured average noise levels were 73.1 dBA L_{EQ} at M1, 68.0 dBA L_{EQ} at M2, 48.8 dBA L_{EQ} at M3, and 65.1 dBA L_{EQ} at M4. The measured average noise levels and concurrent traffic volumes are shown in Table 2. During measurement number two all counted traffic was traveling on

Alta Road. As noted, the measured noise levels are in terms of the average sound level during the noise measurement period. The calculated versus measured noise levels are shown in Table 3.

Table 2
FOLLOW-UP MEASURED NOISE LEVELS AND TRAFFIC VOLUMES

Site	Description	Date Time	dBA L_{EQ}	Cars	Medium Trucks	Heavy Trucks
M1	Otay Mesa Road between Sanyo Avenue and Enrico Fermi Drive, 30 feet from Roadway Centerline	9/19/2011 2:11 to 2:26 p.m.	73.1	170	6	23
M2	Intersection of Alta Road and Calzada de la Fuente, 26 feet from Alta Road Centerline	9/19/2011 2:55 to 3:10 p.m.	68.0	100	1	2
M3	Terminus of Paseo de la Fuente Southwest of Project Site	9/19/2011 3:27 to 3:42 p.m.	48.8	–	–	–
M4	Calzada de la Fuente, Opposite Power Plant Noise Sources	9/19/2011 3:50 to 4:05 p.m.	65.1	–	–	–

Table 3
CALCULATED VERSUS MEASURED TRAFFIC NOISE DATA

Calibration Receiver Position	Calculated	Measured	Difference	Correction
Otay Mesa Road between Sanyo Avenue and Enrico Fermi Drive	73.8 dBA L_{EQ}	73.1 dBA L_{EQ}	0.7 dBA L_{EQ}	None applied
Intersection of Alta Road and Calzada de la Fuente[1]	63.8[1] dBA L_{EQ}	68.0[1] dBA L_{EQ}	4.2[1] dBA L_{EQ}	None applied[1]

[1] The calculated difference between the noise levels at the posted construction speed limit of 35 mph is 4.2 dBA L_{EQ}, however, traffic was observed to be traveling at 40-50 mph during the noise measurement. Modeling the roadway traffic at 45 mph yields at result of 66.7 dBA L_{EQ} for an acceptable difference of only 1.3 dBA L_{EQ}.

2.0 GUIDELINES AND SIGNIFICANCE THRESHOLDS

2.1 Construction Noise Significance Thresholds

Construction noise is governed by the County's Noise Ordinances, excerpts of which are reproduced below.

SEC. 36.408. Hours of Operation of Construction Equipment.

Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

Between 7:00 p.m. and 7:00 a.m.

(b) On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, December 25th, and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10:00 a.m. and 5:00 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410.

SEC. 36.409. Sound Level Limitations on Construction Equipment.

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7:00 a.m. and 7:00 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

SEC. 36.410. Sound Level Limitations on Impulsive Noise.

In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise1 that exceeds the maximum sound level shown in Tables 5 and 6, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 2 (Table 36.410; Section 2.2.2) are as described in the County Zoning Ordinance.

SEC. 36.411. Containers and Construction Material.

It shall be unlawful for any person to handle, transport, or cause to be handled or transported in any public place, any container or any construction material in such a way as to create a disturbing, excessive, or offensive noise[2] as defined in section 36.402 of this chapter.

(Amended by Ord. No. 9962 (N.S.), effective 1-9-09)

[1] "Impulsive noise" means a single noise event or a series of single noise events, which causes a high peak noise level of short duration (one second or less), measured at a specific location. Examples include, but are not limited to, a gunshot, an explosion or a noise generated by construction equipment.

[2] "Disturbing, excessive or offensive noise" means any sound or noise that endangers the health or safety of any person, or causes discomfort or annoyance to a person of normal sensitivity.

2.2 Operational Noise Significance Thresholds

Operational noise impacts are divided into transportation noise and land use noise. These two types of noise are analyzed using different methodologies, and are compared to different significance thresholds.

2.2.1 Transportation Noise Significance Thresholds

Transportation noise impacts would be considered significant if Project implementation would result in the exposure of any on- or off-site, existing or reasonably foreseeable future NSLUs to exterior or interior noise (including noise generated from the Project, together with noise from roads [existing and planned Circulation Element roadways], railroads, airports, heliports, and all other noise sources) in excess of any of the following:

A. Exterior Locations:

   i. 60 dB (CNEL);[3] or

   ii. An increase of 10 dB (CNEL) over pre-existing noise (where the existing noise is less than 50 CNEL).

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

(1) Net lot area up to 4,000 square feet: 400 square feet

(2) Net lot area 4,000 square feet to 10 acres: 10 percent of net lot area

(3) Net lot area over 10 acres: 1 acre

For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations:

   45 dB (CNEL) except for the following cases:

   i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior one-hour average sound level due to noise outside should not exceed 50 dBA.

   ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

[3] If any adopted community noise standard is more stringent than the exterior criterion of 60 decibels CNEL, the analysis of any related impacts due to this standard shall be considered a potential land use impact. The criteria listed in this document are still applicable in all environmental acoustical studies for compliance with California Environmental Quality Act (CEQA) Guidelines for Determining Significance.

2.2.2 Land Use Noise Significance Thresholds

It shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level at any point on or beyond the boundaries of the property will exceed the applicable limits in Table 4, San Diego County Code Section 36.404 Sound Level Limits.

Table 4
SAN DIEGO COUNTY CODE SECTION 36.404 – SOUND LEVEL LIMITS

Zone	Time	One-Hour Average Sound Level Limits (dBA)
(1) R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-90, S-92 and R-V and R-U with a density of less than 10.9 dwelling units per acre	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45
(2) R-RO, R-C, R-M, S-86, FB-V5, V5 and R-V and R-U with a density of 10.9 or more dwelling units per acre	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50
(3) S-94, FB-V4, AL-V2, AL-V1, AL-CD, RM-V5, RM-V4, RM-V3, RM-CD and all commercial zones	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55
(4) FB-V1, FB-V2, RM-V1, RM-V2	7 a.m. to 7 p.m.	60
FB-V1, FB-V2, RM-V1, RM-V2	7 p.m. to 10 p.m.	55
FB-V1, RM-V2	10 p.m. to 7 a.m.	55
FB-V2, RM-V1	10 p.m. to 7 a.m.	50
FB-V3	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	70 65
(5) M-50, M-52 and M-54	Anytime	70
(6) S-82, M-56 and M-58	Anytime	75
(7) S88 (see subsection (c) below)	-	-

(a) If the measured ambient level exceeds the applicable limit noted above, the allowable one-hour average sound level shall be the ambient noise level, plus 3 dB. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(b) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones provided, however, that the one-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 dB at the property line regardless of the zone which the extractive industry is actually located.

(c) S88 zones are Specific Planning Areas which allow for different uses. The sound level limits in Table 4 (Table 36.404) above that apply in an S88 zone depend on the use being made of the property. The limits in Table 4 (Table 36.404), subsection (1) apply to property with a residential, agricultural, or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52, or M54 zone. The limits in subsection (6)

apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

(d) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section, measured at or beyond 6 feet from the boundary of the easement upon which the facility is located.

Section 36.409 states:

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7:00 a.m. and 7:00 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Section 36.410 states:

In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

(e) Except for emergency work or work on a public road Project, no person shall produce or cause to be produced an impulsive noise[4] that exceeds the maximum sound level shown in Table 5, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 5, San Diego County Code Section 36.410 Maximum Sound Level (Impulsive) Measured at Occupied Property, are as described in the County Zoning Ordinance.

Table 5
SAN DIEGO COUNTY CODE SECTION 36.410 – MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(f) Except for emergency work, no person working on a public road Project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 6 when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum

[4] "Impulsive noise" means a single noise event or a series of single noise events, which causes a high peak noise level of short duration (one second or less), measured at a specific location. Examples include, but are not limited to, a gunshot, an explosion or a noise generated by construction equipment.

sound level depends on the use being made of the occupied property. The uses in Table 6, San Diego County Code Section 36.410 Maximum Sound Level (Impulsive) Measured at Occupied Property for Public Road Projects, are as described in the County Zoning Ordinance.

Table 6
SAN DIEGO COUNTY CODE SECTION 36.410 –
MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY FOR PUBLIC ROAD PROJECTS

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

(g) The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period.

If the sound level caused by construction equipment or the producer of the impulsive noise, exceeds the maximum sound level for any portion of any minute it will deemed that the maximum sound level was exceeded during that minute.

2.3 Ground-borne Vibration Significance Thresholds

Impacts associated with ground-borne vibration and noise would be significant if Project implementation would expose the uses listed in Table 7 to ground-borne vibration or noise levels equal to or in excess of the levels shown:

Table 7
GUIDELINES FOR DETERMINING THE SIGNIFICANCE OF GROUND-BORNE VIBRATION AND NOISE IMPACTS

Land Use Category	Ground-borne Vibration Impact Levels (inches/sec [root mean square])		Ground-borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior operations (research and manufacturing facilities with special vibration constraints)	0.0018[3]	0.0018[3]	Not applicable[5]	Not applicable[4]
Category 2: Residences and buildings where people normally sleep (hotels, hospitals, residences and other sleeping facilities)[5]	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use (schools, churches, libraries, other institutions and quiet offices)[5]	0.0056	0.014	40 dBA	48 dBA

Source: U.S. Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

1 "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

2 "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

3 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

4 There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories.

5 For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when the peak particle velocity (PPV) exceeds one inch per second. Continuous or frequent intermittent vibration sources such as impact pile drivers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance were developed by Caltrans (2004) and will be used to evaluate these continuous or transient sources in San Diego County.

2.4 Sensitive Species Significance Thresholds

The site and surrounding area includes Diegan coastal sage scrub (including disturbed), coastal sage-chaparral scrub, chamise chaparral, southern mixed chaparral, non-native grassland, and disturbed habitat. This habitat area included Seventeen (17) sensitive animal species, the federally listed threatened coastal California gnatcatcher (*Polioptila californica californica*; CAGN). Some studies, such as that completed by the Bioacoustics Research Team (1997), have concluded that 60 dBA is a single, simple criterion to use as a starting point for passerine impacts until more specific research is done (County 2010). Associated guidelines produced by the U.S. Fish and Wildlife Service (USFWS) require that noise be limited to a level not to exceed 60 dBA L_{EQ} or the average ambient noise level, whichever is greater, at the edge of habitat occupied by the Least Bell's Vireo during its breeding season. This threshold has consistently been applied to sensitive avian species by various jurisdictions, including San Diego County. Therefore, if project construction or operation occurs adjacent to occupied habitat during the breeding season (March 1 through September 15), noise planning and control would be required.

3.0 POTENTIAL CONSTRUCTION NOISE IMPACTS

This section focuses on Project site construction noise and vibration impacts to adjacent land uses.

3.1 Site Construction Activities

The construction phase of a quarry operation is similar to the operation of the quarry; during the initial construction phase, the quarry would not have operations whose purpose is solely to prepare materials. Rather, the equipment at the site would be preparing the site for the placement of the quarry equipment which may include crushers, concrete, and asphalt handling systems as described above. The construction phase may also include scraping topsoil from areas which would be later mined for construction materials.

In most cases, the construction would create less noise than the overall operation because the equipment used for construction would be identical to that used for operation (i.e., rock drills, dozers, loaders and trucks) but without the additional large area of noise sources used for rock crushing and other plant operations.

The proposed plant equipment is normally provided by the manufacturer in sections that require minimal on-site set up, and would be transported to the Project impact footprint via trucks. These equipment sections would be set up in phases, starting with basic crushing equipment and only followed by other equipment when the site is leveled and has the materials production (and product demand requirements) on-line to support the next phase of plant operation. This "bootstrap"-type operation typically includes some materials extraction and stockpiling of the materials around the plant area as part of the site leveling and preparation.

3.2 Potential Construction Noise Impact Locations

As noted, there are no property lines of existing residences and no NSLUs near the site nor are any expected to be developed prior to the site construction. The only nearby developed land use is the Calpine energy plant which does not have any NSLUs.

3.3 Potential Construction Noise Impacts

The operation of a heavy dozer to provide the initial road clearing and widening would be the loudest noise source during construction. With an operating noise level of approximately 85 dBA at 50 feet, it is unlikely that this type of equipment would exceed the allowable eight-hour average of 75 dBA at the property line given (1) the normal speed of equipment operation and (2) that the equipment would move towards the center of the site (away from the initial driveway opening). No other typical roadway construction equipment would exceed this noise level impact. **Impact: Less than Significant**

3.4 Potential Impulsive Noise Impacts

Drilling, blasting and breaking may be required as part of the site construction.

3.4.1 Drilling and Blasting

Typical blasting noise is less than 105 dBA Sound Equivalent Level (SEL) for each blast shot hole. Based on a 600-hole shot pattern, this would equal a 97.3 dBA L_{EQ} at the 50-foot distance (105 dBA SEL times 600 minus 35.6). This would be reduced to 77.3 dBA at 500 feet.

Drilling operations typically are required to place the blasting charges. Noise associated with drill rig operations would be consistent with (or less than) the other heavy equipment analyzed for use on the site.

3.4.2 Breaking

Depending upon the size of rocks created during blasting, hydraulic breaking may be required prior to loading into the crushing systems. Most feed crushers (crushers who are initially loaded with material versus a crusher fed by a belt from another crusher or screen) have a breaker on an arm mounted over the crusher. This allows the occasional oversize rock which gets inadvertently fed into the machine to be reduced to a size which the crusher can handle. These breakers are normally used less than once per day and are not considered in the analysis. The evaluation noise level for a breaker is shown in Table 8.

Table 8
BREAKER NOISE LEVELS AND EVALUATION PARAMETERS

Expected Equipment	Octave Band Noise Level[1] (L_{EQ}) (Hz)								Overall Noise Level (dBA)
	63	125	250	500	1K	2K	4K	8K	
Breaker	113.5	118.5	116.5	118.5	122.5	119.5	118.5	116.5	126.7

[1] Based on Sound Power Levels (S_{WL})

The continuous use of a breaker would create an hourly noise level greater than 75 dBA L_{EQ} at distances less than 500 feet. There are no property lines of existing residences and no NSLUs within this distance.

Noise associated with drill rig operations and the continuous use of a breaker would not affect noise-sensitive receptors. **Impact: Less than Significant.**

3.5 Potential Ground-borne Vibration Impacts

To provide a basis for the blasting analysis, Leland Jones (Jones Seismic Services) provided typical blast decay rates for the Superior Ready Mix Quarry in Mission Valley. This quarry and the surrounding area have similar subsurface materials. The K-Factor calculated from multiple monitored blasts for the quarry range from 169 to 250.

A typical-to-larger blast at the Mission Valley quarry uses a 10-foot-by-12-foot shot hole pattern with 170 holes. The shot holes are drilled with a 4.5-inch diameter drill bit. The hole depth is approximately 26 feet. Each shot hole is loaded with an electric booster charge and an approximate 140-pound (average water gel explosive) charge per shot hole (approximately 23,800 pounds). Each shot hole is stemmed using fine gravel.

The calculated PPV = K * $(D_S)^{-1.6}$ (Equation 13, Caltrans, Transportation- and Construction-Induced Vibration Guidance Manual, Jones and Stokes, June, 2004)

PPV = peak particle velocity (in in/sec),
D_S = square-root scaled distance (distance to receiver in ft. divided by square root of charge weight in pounds.)

D = 1,500-feet (approximately) to closest offsite equipment
D_S = 1,500 / [23,800 $^{(-2)}$] = 9.72306
PPV = 0.0056 to 0.01037 IPS (K = 250/169)

This level of vibration would be less than significant to any human receptor. Any sensitive equipment with vibration isolators would allow the equipment to operate with no interference at this level. **Impact: Less than Significant.**

3.6 Alternatives

Under the No Project/No Action Alternative, no construction noise impacts would occur.

Construction noise impacts associated with the Extraction to Natural Grade Alternative, Extraction to 50-foot Depth Alternative, and Extraction to 200-foot Depth Alternative would be approximately the same as the Proposed Project.

Construction noise levels associated with the No Project/Existing Plan Alternative would be substantially greater than those associated with the Proposed Project due to the more intensive development (including residences, industrial facilities, and associated infrastructure) that would occur under this alternative when compared to the Proposed Project. In addition, while there are currently no NSLUs in the vicinity of the Project site, rural residences developed under the No Project/Existing Plan Alternative would be exposed to construction noise from subsequent construction activities under this alternative, if construction is phased and the residential uses are developed first. Therefore, potentially significant impacts would occur under this alternative.

3.7 Design Considerations and Mitigation Measures

There are no design considerations or mitigation measures considered in this analysis.

3.8 Cumulative or Combined Noise Impacts

Based on the size and type of construction, no cumulative noise impacts associated with construction would occur. The addition of the Project construction noise at any location beyond the immediately adjacent properties would not contribute to a significant cumulative impact, as no other concurrent construction activities in the immediate area are known or planned. **Impact: Less than Significant.**

3.9 Conclusions

Construction at the Project site would occur in compliance of the applicable ordinances.

4.0 POTENTIAL OPERATIONAL NOISE FROM TRANSPORTATION SOURCES

This section focuses on noise impacts to NSLUs from operational noise associated with proposed Project-generated vehicle trips

The proposed development of the Otay Mesa area would result in other land development projects and two new roadways (SR 11 and Lone Star Road), which could impact the Project's traffic flow patterns. However, no planning is possible at this time for Lone Star Road.

4.1 Noise Sources

Noise sources are divided between on-site noise sources and off-site noise sources, each of which is further subdivided into transportation and non-transportation noise sources.

4.1.1 Off-site Transportation Noise Sources

Impacts from transportation noise sources are governed by the noise element thresholds contained in Section 2.2.1.

The Caltrans Technical Noise Supplement (November 2009) notes that 8 to 10 percent of the average daily traffic volumes provides a near equivalence between the peak hour dBA L_{EQ} and CNEL. A 10 percent traffic volume was used in the computer noise models to provide a CNEL-equivalent noise output. Non-Project traffic was assumed to be 94 percent automobiles, 3 percent medium trucks (MT; trucks with two axles, one with more than two wheels), and 3 percent heavy trucks (HT; trucks with three or more axles). This vehicle composition typically over-estimates the number of trucks, and as such, creates a slightly conservative over-estimate of potential noise levels.

The existing year traffic (2017) is provided in Table 9 for the daily ADT and peak hour (10% of ADT) by type vehicle counts for the roadway traffic noise model.

Table 9
EXISTING 2017 TRAFFIC ADT AND PEAK HOUR BY TYPE VEHICLE COUNTS

Roadway Segment	Total ADT	Heavy Trucks	Medium Trucks	Passenger
		3.0%	3.0%	94.0%
Calzada de la Fuente				
East of Alta Road	1,196	4	4	113
Alta Road				
Calzada de la Fuente to Lone Star Road (Paseo de la Fuente)	7,250	22	22	682
Lone Star Road (Paseo de la Fuente) to Otay Mesa Road	7,913	24	24	744
Lone Star Road				
West of Alta Road	0	0	0	0
Otay Mesa Road				
Alta Road to Enrico Fermi Drive	9,065	28	28	853
Enrico Fermi Drive to Sanyo Avenue	5,327	16	16	501
Sanyo Avenue to SR 125	10,372	32	32	975
SR 125 to La Media Road	11,159	34	34	1,049
Enrico Fermi Drive				
Otay Mesa Road to SR 905	7,271	22	22	684
SR 905 to Airway Road	4,920	15	15	463
SR 905			**15**	
Enrico Fermi Drive to Sanyo Avenue	6,000	18	18	564
Sanyo Avenue to La Media Road	45,500	137	137	4,277
Airway Road				
West of Enrico Fermi Drive	3,355	11	11	316

The area opening year traffic (2019) is provided in Table 10 below for the daily ADT and peak hour by type vehicle counts for the roadway traffic noise model.

Table 10
OPENING YEAR TRAFFIC NO PROJECT AND PEAK HOUR BY TYPE VEHICLE COUNTS

Roadway Segment	Total ADT	Heavy Trucks	Medium Trucks	Passenger
		3.0%	3.0%	94.0%
Calzada de la Fuente				
East of Alta Road	1,316	4	4	124
Alta Road				
Calzada de la Fuente to Lone Star Road (Paseo de la Fuente)	7,975	24	24	750
Lone Star Road (Paseo de la Fuente) to Otay Mesa Road	8,704	27	27	819
Lone Star Road				
West of Alta Road	0	0	0	0
Otay Mesa Road				
Alta Road to Enrico Fermi Drive	9,972	30	30	938
Enrico Fermi Drive to Sanyo Avenue	5,860	18	18	551
Sanyo Avenue to SR 125	11,805	36	36	1,110
SR 125 to La Media Road	12,275	37	37	1,154
Enrico Fermi Drive				
Otay Mesa Road to SR 905	7,998	24	24	752
SR 905 to Airway Road	5,583	17	17	525
SR 905				
Enrico Fermi Drive to Sanyo Avenue	6,600	20	20	621
Sanyo Avenue to La Media Road	50,050	151	151	4,705
Airway Road				
West of Enrico Fermi Drive	3,690	12	12	347

[1] Phase 1 + 2
[2] SANDAG Series 13 2035

4.1.1.1 *Project-generated Transportation Noise Sources*

The Project trip generation information is divided into two parts: average Project trip generation and maximum Project trip generation. This report focuses on conservative noise impacts and, therefore, utilizes the maximum Project trip generation rates.

The maximum trip generation calculations for the Project yield a total of opening day 520 truck trips per day for operations (phases 1 + [2 or 3]) and an additional 108 ADT associated with passenger (employee) vehicles (employees, construction workers, vendors; phases 1 + [2 or 3]). The export trucks are proposed to operate between the hours of 5:30 a.m. and 10:00 p.m. Trucks importing sand, cement, and oil would operate 24 hours per day. The detailed truck and passenger vehicle trips, including AM and PM peak hour trips, are provided in Tables 11 and 12, respectively.

Table 11
PROJECT MAXIMUM TRUCK TRIP GENERATION RATES

Activity	Trucks (Units)	AM Peak Hour Trips[1]	PM Peak Hour Trips[1]
Phase 1			
Equipment/Plant Deliveries	20	10	10
Sub-Total Phase 1	20	10	10
Phases 2 and 3			
Concrete Production	179	42	42
Asphalt Production	74	17	17
CTB[2] Production	37	9	9
Rock Sales	112	9	9
Sub-Total Production Truck Trips[3]	**402**	**77**	**77**
Concrete Production	14	2	2
Asphalt Production	7	1	1
Sub-Total Sand Import Truck Trips	**21**	**3**	**3**
Concrete Production	10	2	2
CTB[2] Production	1	0	0
Sub-Total Cement Import Truck Trips	**11**	**2**	**2**
Asphalt Production	4	1	1
Sub-Total Oil Import Truck Trips	**4**	**1**	**1**
Recycle Production	37	9	9
Recycle Import	45	11	11
Sub-Total Recycling Truck Trips	**82**	**20**	**20**
TOTAL TRUCK TRIPS (Phases 2 & 3)	**520**	**103**	**103**
Phase 4			
Infill Material	130	31	31
TOTAL TRUCK TRIPS (Phase 4)	**130**	31	31

Table 12
MAXIMUM PASSENGER VEHICLE TRIP GENERATION

Employees	Total	AM Peak Hour Trips[1]	PM Peak Hour Trips[1]
Phase 1			
Construction Workers	38	15	15
Vendors	30	0	0
TOTAL PASSENGER TRIPS	**68**	**15**	**15**
Phase 2, 3, or 4			
Processing Plant	38	2	2
Truck Drivers	40	13	27
TOTAL PASSENGER TRIPS	**78**	**15**	**29**

Source: Darnell & Associates, December 2017

[1] A "trip" is a round-trip, in-and-out event.

The project traffic distribution and the distributed Project Peak Hour traffic (Phases 1 + [2 or 3]) are shown in Table 13. Note: Tables 13 and 14 provide the full project traffic assigned to the vehicle type; Figures 5 and 9 in the traffic report only provides the actual truck values not in Passenger Car Equivalent (PCE) and does not reflect the project passenger vehicles therefore, these tables may not be directly compared to the traffic report.

Table 13
PROJECT TRAFFIC DISTRIBUTION AND MAXIMUM PROJECT TRAFFIC PEAK HOUR (PHASES 1 + [2 OR 3])

Roadway Segment	Project Traffic Distribution	Trucks[1]	Passenger Vehicles
		113	44
Calzada de la Fuente			
East of Alta Road	100%	113	44
Alta Road			
Calzada de la Fuente to Lone Star Road (Paseo de la Fuente)	100%	113	44
Lone Star Road (Paseo de la Fuente) to Otay Mesa Road	94%	107	42
Otay Mesa Road South	3%	4	2
Lone Star Road			
West of Alta Road			
Otay Mesa Road			
Alta Road to Enrico Fermi Drive	91%	103	41
Enrico Fermi Drive to Sanyo Avenue	48%	55	22
Sanyo Avenue to SR 125	45%	51	20
SR 125 to La Media Road	33%	38	15
Enrico Fermi Drive			
Alta Road to Enrico Fermi Drive	91%	49	19
Enrico Fermi Drive to Sanyo Avenue	48%	15	6
Sanyo Avenue to SR 125	45%	7	3
SR 905			
Enrico Fermi Drive to Sanyo Avenue	30%	34	14
Sanyo Avenue to La Media Road	30%	34	14
Airway Road			
West of Enrico Fermi Drive	7%	8	4

[1] Phase 1 + (2 or 3)

4.1.1.2 *Modeled Traffic Scenarios*

The Opening year 2019 area peak hour plus the project generated peak hour (Phases 1 + [2 or 3]) is shown in Table 14.

Table 14
OPENING YEAR PEAK HOUR TRAFFIC WITH PROJECT
(Phases 1 + [2 or 3])

Roadway Segment	Heavy Trucks	Medium Trucks	Passenger
Calzada de la Fuente			
East of Alta Road	117	4	168
Alta Road			
Calzada de la Fuente to Lone Star Road (Paseo de la Fuente)	137	24	794
Lone Star Road (Paseo de la Fuente) to Otay Mesa Road	134	27	861
Lone Star Road			
West of Alta Road	0	0	0
Otay Mesa Road			
Alta Road to Enrico Fermi Drive	133	30	979
Enrico Fermi Drive to Sanyo Avenue	73	18	573
Sanyo Avenue to SR 125	87	36	1,130
SR 125 to La Media Road	75	37	1,169
Enrico Fermi Drive			
Otay Mesa Road to SR 905	73	24	771
SR 905 to Airway Road	32	17	531
SR 905			
Enrico Fermi Drive to Sanyo Avenue	20	20	621
Sanyo Avenue to La Media Road	185	151	4,719
Airway Road			
West of Enrico Fermi Drive	46	12	361

4.1.2 Off-site Non-transportation Noise Sources

Off-site non-transportation noise sources include the existing Calpine Power Plant, Core Civic Detention Center, Vulcan Materials Plant, and Otay Truck Center, as well as possible future technology business park, industrial, and residential land uses in the vicinity. Noise generated by off-site non-transportation noise sources has no bearing on this analysis, however, per the relevant ordinances discussed in Section 2.2.2.

4.1.3 On-site Transportation Noise Sources

On-site transportation noise would consist of site personnel and truck access from public right-of-way to the interior of the site. Note that on-site material haul route traffic is not analyzed in accordance with County Noise Element transportation noise guidelines (see Section 2.2.1), but with the County's property line noise ordinance limits (see Section 2.2.2). This is because the routes would not be on public roadways, but are instead an intrinsic portion of the quarry operation.

On-site traffic-related noise would be generated by vehicles traveling at slow speeds (both trucks and employee vehicles) utilizing the access road to a parking area immediately within the Project site. This noise would be insubstantial and is not further analyzed.

4.1.4 On-site Non-transportation Noise Sources

As discussed in the Project description, the site would utilize numerous types of material processing and handling systems. These noise sources are analyzed in detail in Section 5.0.

4.2 Potential Noise Impact Identification

County guidelines identify any residence and other typically human-occupied indoor area and residential outdoor use area as NSLUs, which are regulated to 45 and 65 CNEL respectively. Also, the City identifies possible indoor and outdoor traffic noise impacts to industrial land uses as 75 and 50 CNEL respectively. During the site visit, no NSLUs were identified at the industrial land uses located in the County jurisdiction, therefore no impacts could occur.

4.2.1 Off-site Noise Impacts Due to Project-generated Off-site Traffic

The CNEL/L_{DN} is approximately equivalent to the peak hour average noise level from traffic, as suggested in the Wyle Laboratories Study (1973) and Caltrans' Technical Noise Supplement (TeNS; Caltrans 2013).

Analysis of traffic noise impacts is limited to the roadways (excluding SR 11, as its noise impacts were analyzed during its planning) to the east of the SR 125/905 corridor. As stated above, there are three NSLUs (residences) along Otay Mesa Road approximately 1.3 miles away from the Project site. The traffic-related noise impacts to these residences at their front yard property line adjacent to Otay Mesa Road are presented in Table 15. Note that residence numbers one and three are on the same Assessor's Parcel Number (APN) lot. According to the San Diego Association of Governments (SANDAG) website, this is a large lot that wraps around the residence on Lot 2.

Table 15
TRAFFIC-RELATED NOISE IMPACTS

Residence No./Location	Peak Hour dBA L_{EQ}/CNEL				Potentially Significant Impact?	
	2017	2019 No Project	2019 w/ Project	Project Change	Exterior	Interior
#1 Front of 6940 Otay Mesa Road, APN 646-080-11 (West)	66.4	66.9	70.4	3.5	N[1]	Y
#1 Backyard of 6940 Otay Mesa Road, APN 646-080-11	52.5	52.8	56.6	3.8	N	-
#2 Front of 6944 Otay Mesa Road, APN 646-080-12	66.5	66.9	70.4	3.5	N[1]	Y
#2 Backyard of 6944 Otay Mesa Road, APN 646-080-12	56.7	57.2	60.8	3.6	N	-
#3 Front of 6980 Otay Mesa Road, APN 646-080-11 (East)	66.6	67.0	70.6	3.6	N[1]	Y
#3 Backyard of 6980 Otay Mesa Road, APN 646-080-11	56.8	57.2	61.1	3.9	Y	-

The traffic data used for calculations presented in this table are provided in Table 9 of this report.
[1] Front yards are not a NSLU.
[2] No interior noise area.
[3] 100 feet from roadway centerline.
[4] No NSLU present.
N = no; Y = yes

Shown in Table 16 are the traffic-related noise impacts for the analyzed roadways at a standardized distance of 100 feet from the roadway centerlines. Note: Undeveloped roads not expected to be developed as a paved through road until after the 2019 Opening Year (assumed prior to 2050) use a dash (-).

Table 16
PEAK HOUR dBA L_{EQ}/CNEL AT 100-FEET

Roadway Segment	Opening Year	Opening Year With Project	Change	Potentially Significant Impact?	2050
Calzada de la Fuente					
East of Alta Road	53.5	63.4	9.9	N[1]	64.1
Alta Road					
Calzada de la Fuente to Lone Star Road (Paseo de la Fuente)	63.8	67.2	3.4	N[1]	72.1
Lone Star Road (Paseo de la Fuente) to Otay Mesa Road	64.3	67.3	3.0	N[1]	70.5
Otay Mesa Road South	-	-	-	N[1]	
Lone Star Road					
West of Alta Road	-	-	-	N[1]	70.9
Otay Mesa Road					
Alta Road to Enrico Fermi Drive	67.2	69.5	2.3	N[1]	71.0
Enrico Fermi Drive to Sanyo Avenue	66.5	68.6	2.1	N[12]	72.3
Sanyo Avenue to SR 125	67.9	69.1	1.2	N[1]	74.2
SR 125 to La Media Road	68.1	68.9	0.8	N[1]	74.1
Enrico Fermi Drive					
Otay Mesa Road to SR 905	63.9	65.6	1.7	N[1]	68.0
SR 905 to Airway Road	62.3	63.2	0.9	N[1]	64.1
Airway to Siempre Viva Rd	62.3	62.7	0.4	N[1]	65.1
Airway Road					
West of Enrico Fermi Drive	58.1	58.9	0.8	N[1]	64.3

[1] No Residential Uses
[2] The three residences are discussed separately

4.2.1.1 *Residential Locations*

Residential Exterior Locations

The exterior usable space of the three analyzed residences along Otay Mesa Road (located at 6940 and 6980 Otay Mesa Road; APNs 646-080-12 and 646-080-11) would have noise levels above 60 CNEL during all Project and No Project scenarios. **Impact: Significant**

Residential Interior Locations

The analyzed residences along Otay Mesa Road were built prior to any exterior-to-interior planning requirements. Based on the minimum exterior-to-interior planning structure noise reduction of 15 CNEL (presumed by Title 24 California Building Code minimum residential exterior to interior noise control), the interiors of these residences would probably have interior noise levels above 45 CNEL for all scenarios. **Impact: Significant**

4.2.1.2 *Industrial Locations*

Industrial Exterior Locations

While exterior use locations at off-site industrial land uses could experience significant impacts from noise levels over 74 CNEL, no outdoor use areas were observed during the site visit. **Impact: Less than Significant**

Industrial Interior Locations

All roadway segments in the Project study area have the potential to impact interior offices of existing industrial land uses: Otay Mesa Road from Harvest Road to Sanyo Avenue; Otay Mesa Road from Sanyo Avenue to Vann Centre Boulevard; Otay Mesa Road from Britannia Boulevard to La Media Road; Otay Mesa Road from La Media Road to Piper Ranch Road; and, Enrico Fermi Drive from Airway Road to Siempre Viva Road. For distinct reasons, none of the five aforementioned roadway segments would experience significant impacts. The industrial use on Otay Mesa Road between Harvest Road and Sanyo Avenue is a small power plant with no permanent office space on-site and has no noise-sensitive interior space to be impacted, so impacts would not occur. The industrial use on Otay Mesa Road between Sanyo Avenue and Vann Centre Boulevard has no windows fronting Otay Mesa Road, and therefore could not have office spaces along that wall while being in compliance with building fire codes; accordingly, those industrial uses could not have noise-sensitive office space fronting Otay Mesa Road and no impacts would be possible. The industrial land uses along Otay Mesa Road between Britannia Boulevard and La Media Road would not experience the 3 CNEL Project-related increase required for a significant impact to occur. The industrial land uses along Otay Mesa Road between La Media Road and Piper Ranch Road would not experience a noise level increase of at least 3 CNEL, and would also not experience a significant impact. Lastly, the industrial use along Enrico Fermi Drive between Airway Road and Siempre Viva Road would experience only a 0.6-CNEL increase, which is less than the 3-CNEL increase required for a significant impact to occur. **Impact: Less than Significant**

4.2.2 Off-site Noise Impacts Due to On-site Transportation Noise Sources

On-site traffic noise would be by traffic traveling on the on-site access roads for truck and employee traffic. This traffic would create noise at peak levels of approximately 60 dBA at 100 feet from the roadway centerline, the impacts of which are evaluated at adjacent off-site areas. The areas adjacent the Project impact footprint are zoned/designated as technology business park, residential, and industrial; however, no sensitive receivers (such as residences) are constructed adjacent to the Project boundary. As previously stated, three residences occur approximately 1.3 miles from the Project site along Otay Mesa Road. These residences are far enough away from the site that they would not be affected by on-site traffic-related noise. **Impact: Less than Significant**

4.2.3 Alternatives

Under the No Project/No Action Alternative, no noise impacts would occur.

Noise impacts associated with the Extraction to Natural Grade Alternative would be less than that of the Proposed Project because this alternative would result in 2,154 ADT (as opposed to 2,674 ADT under the Proposed Project).

Noise impacts associated the Extraction to 50-foot Depth Alternative and Extraction to 200-foot Depth Alternative would be the same as the Proposed Project.

Noise impacts associated with the No Project/Existing Plan Alternative would be greater than that of the Proposed Project because this alternative would result in 8,628 ADT (as opposed to 2,674 under the Proposed Project).

4.3 Design Considerations

The existing residences located along Otay Mesa Road were analyzed as noise barriers for the exterior (backyard) noise impact analysis.

4.3.1 Mitigation Measurement Calculations

Preliminary modeling in TNM was performed which indicated that noise barriers in excess of 20 feet with returns on the residential properties to accommodate driveways would be required to fully mitigate impacts to the three affected residences along Otay Mesa Road. The County of San Diego zoning ordinance 6708, Permitted Fences, Walls, Gates and Entry Structures, specifies that noise walls heights should not normally exceed 72 inches in height for backyard walls and 42 inches for front yard walls. The County normally permits walls to be planned as berm-wall combination up to 9 feet in height (which is probably not feasible at these residences). The construction of noise walls to the requisite height to control the noise from heavy truck traffic immediately adjacent to the roadway would require walls significantly higher than specified above. Therefore, this mitigation, while feasible would probably not be permitted by the County of San Diego and is unlikely to be desired by the residents of the houses. Residents may request the construction of shorter noise walls in front of their property; however, the walls would not fully mitigate impacts. Accordingly, impacts are conservatively assessed as significant and unmitigated. **Impact: Significant and Unmitigated**

4.3.2 Design Consideration Calculations

No Project design considerations were included in the analysis.

4.4 Cumulative Noise Impacts

Significant cumulative noise impacts to the existing three residences would occur regardless of whether or not the Project is implemented. The Project would raise the noise levels at these residences to above 70 CNEL with a potential greater than 3 CNEL increase a level which is defined as unacceptable for residential land use. **Impact: Significant**

4.5 Conclusions

The Project would result in significant impacts to three residences located along Otay Mesa Road. Noise barriers in excess of 20 feet with returns on the residential properties to accommodate driveways would be required to fully mitigate impacts to the three affected houses along Otay Mesa Road. This mitigation, while feasible, is unlikely to be desired by the residents of the houses or permitted by the County of San Diego. Residents may request the construction of shorter noise walls in front of their property; however, the walls would not fully mitigate impacts. Accordingly, impacts are conservatively assessed as significant and unmitigated. No other significant impacts were identified.

5.0 POTENTIAL OPERATIONAL IMPACTS

This section analyzes the property line noise impacts from land use noise sources (land use [non-transportation] noise sources include noise associated with on-site materials transportation and extractive activities).

Proposed excavation/mining activities would occur throughout the Project impact footprint during the life of the Project. The plant equipment would be placed in the northern portion of the Project impact footprint, where it is proposed to remain throughout the life of the Project.

While quarry operations may occur at any location throughout the life of the Project, the drilling, blasting and excavation are typically limited to a localized area and not spread over the entire Project site.

Planning would be based on a localized consideration where the extraction is occurring close to a property line.

5.1 Controlling Ordinances

The proposed on-site land use is an extractive industry; therefore, the land use property line noise limit is 75 dBA L_{EQ} at all times of the day.

The noise element of the General Plan notes that the potential impacts to NSLUs should be based on the 24-hour CNEL metric, and should be calculated as a cumulative for transportation and *noise from all other noise sources.*[5] The element contains the additional notation: *In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area: (3) Net lot area over 10 acres: 1 acre.*[6]

Therefore, the hourly noise impact at the planning receivers (Figure 5) is used to calculate a CNEL based on the 6:00 a.m. to 5:00 p.m. operating hours.[7] The Project would generate insubstantial noise during the remaining hours. Based on an assumed constant noise for all of the operating hours the calculated CNEL is exactly 0.8 dB less than the calculated hourly dBA L_{EQ}. For the

[5] Italics added to element quotation.
[6] All adjacent lots are in excess of 10 acres therefore only item (3) is included in the discussion.
[7] With extended operating hours, the CNEL contours listed in Table 21 would extend out to greater distances.

purpose of analysis, the 60 dBA L_{EQ} contour is considered to be equivalent to the 60 CNEL contour.

5.2 Potential Impact Locations and Traffic Noise Levels

The only existing NSLUs are located at distances greater than one mile from the site, and are not further considered for on-site operational impact noise. There are, however, properties which are appropriately zoned and may be developed with NSLUs during the Proposed Project duration.

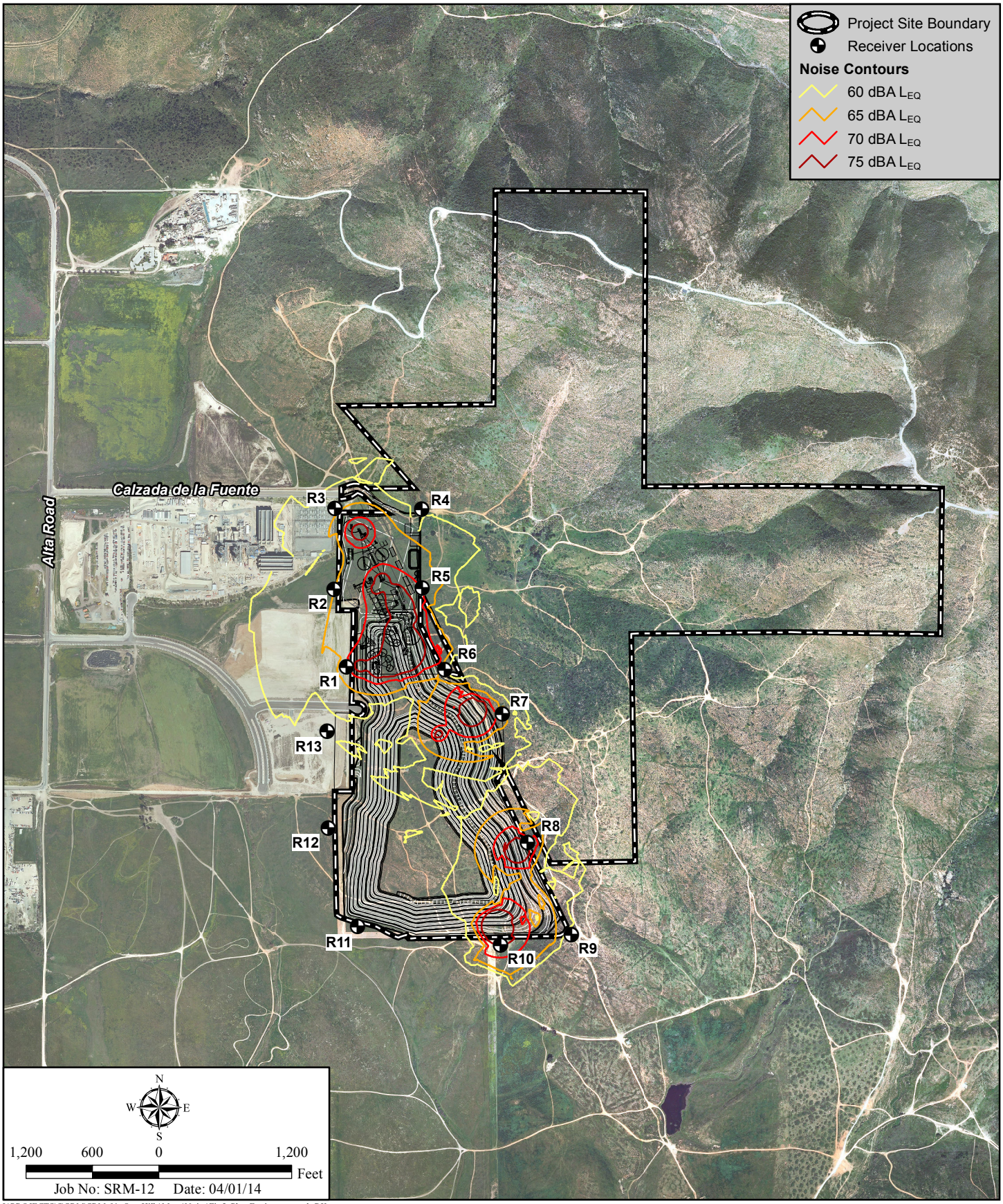
5.3 Potential Operational Noise Sources

During Phase 1, the main plant facilities would be set up in the central portion of the area. The tentative plant layout is shown on Figure 4. To provide a full site noise analysis of the mining operations, as well as operations of the plant facilities, a single at-grade potential excavation area is conservatively analyzed. Activities at this location would include initial area grading and dozing operations, followed by drilling, blasting, excavation, and hauling.

The plant equipment labeling shown in the figure is expanded in Table 17 and includes a notation if the specific equipment is analyzed as a noise source.

Table 17
SITE EQUIPMENT PLAN

Number	Description	Noise Source (Y/N)
Aggregate Processing Equipment		
CR1	Jaw Crusher	Y
CR2	Cone Crusher	Y
CR3	Cone Crusher	Y
CR4	Vertical Shaft Impact Crusher	Y
CR5	Vertical Shaft Impact Crusher	Y
CR6	Impact or Cone Crusher	Y
S1	Screen	Y
S2/S3	Stacked Screens	Y
S4-S7	Screens	Y
N/A	Stock Piles	Y
B1 thru B50	Materials Handling Belts	N
N/A	Sand Washing System	N
N/A	Stock Piles	Y
HF1-HF2	Hopper Feeder	N
FH3	Feeder Hopper	N
Materials Recycling Equipment		
RCR1	Jaw Crusher	Y
RCR2	Horizontal Shaft Impact Crusher	Y
RS1, RS2	Screens	Y
RB1 thru RB5	Materials Handling Belts	N
N/A	Stock Piles	Y



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Noise Contours for Plant Equipment & Material Extraction Condition 3

OTAY HILLS

Figure 5

HELIX Environmental Planning

Table 17 (cont.)
SITE EQUIPMENT PLAN

Number	Description	Noise Source (Y/N)
Asphaltic Concrete Plant		
HF6-HF9	Hopper Feeder	N
N/A	Pug Mill	N
N/A	Bag Filter System	Y
N/A	Stock Piles	N
Ready Mix Concrete Equipment		
N/A	Feeder Hopers/Truck	N
N/A	Belt System	N
Concrete Treated Base Plant Equipment		
N/A	Pug Mill	N

The following information is a brief description of the various operational activities which would occur at the facilities.

Drilling/Blasting

Drilling would be necessary to create holes for blasting materials. A typical drilling grid would be approximately 60 by 120 feet with holes 45 feet in depth. Up to one blast per week would occur. Rock drill noise levels would vary. Noise measurements of a rock drill were conducted at a similar facility, the Superior Ready Mix Mission Gorge facility, where noise from an Ingersoll-Rand Model ECM-680 rock drill was measured.

The Project would be required to comply with the County's Consolidated Fire Code (County 2017), which includes restrictions for blasting operations. Specifically, per Section 5601.2.6, blasting is only allowed Monday through Saturday, between the hours of 7:00 a.m. and 6:00 p.m. or 1/2 hour before sunset, whichever occurs first, unless special circumstances requiring other time or days is approved by the County.

Further, Section 5601.2.7 requires that the property owner is required to provide notice in writing (at a minimum of 24 hours prior to blasting operations) for any proposed blasting to the local fire agency and to all residences, including mobile homes, and businesses within 600 feet of any potential major blast location or 300 feet from any potential minor blast location.

The property owner is required to implement the following procedures for all blasting operations:

1. The blaster shall retain an inspector to inspect all structures, including mobile homes, within 300 feet of the blast site before blasting operations, unless inspection is waived by the owner and/or occupant. The inspector shall obtain permission of the owner and/or occupant before conducting the inspection. The inspection shall be only for the purpose of determining the existence of any visible or reasonably recognizable preexisting defects or damages in any structure. Waiver of inspection shall be in writing signed by the owner and/or occupant. Refusal to allow inspection shall also constitute a waiver. The inspector shall notify the owner and/or occupant of the consequences of refusing an inspection shall

include a refusal in the summary report filed with the Issuing Officer. The blaster shall request an inspector conduct post-blast inspections upon receipt of a written complaint of property damage if the complaint is made within 60 days of completion of blasting operations. If the blaster has knowledge of alleged property damage independent of the written complaint, the blaster shall also retain an inspector to conduct a post-blast inspection.

2. An inspector shall complete and sign pre-blast inspection reports identifying all findings and inspection waivers. The blaster shall retain the inspection reports for three years from the date of the blasting and upon a complaint of alleged damage the blaster shall immediately file a copy of the report with the Issuing Officer and provide a copy to the complainant. If there is a change in the blasting contractor after blasting has commenced on a project, a re-inspection shall be conducted in accordance with the preceding paragraph before the new blasting contractor undertakes any additional blasting.

3. The blaster shall retain an inspector to conduct a post-blast inspection of any structure for which a written complaint alleging blast damage has been received. A written report of the inspection shall be immediately filed with the Issuing Officer and provided to any person who made a complaint for damages.

4. The blaster shall allow any representative of the Issuing Officer to inspect the blast site and blast materials or explosives at any reasonable time.

5. If the blaster wants a representative of the Issuing Officer to witness a blasting operation the blaster shall make a request with the Issuing Officer at least 12 hours before the blast. The blaster shall confirm the request for a witness with the Issuing Officer at least one hour before the blast. The blaster shall be responsible for any cost incurred by the Issuing Officer in having a representative witness the blast.

6. The blaster shall notify the Issuing Officer on the day of a scheduled blasting operation not less than one hour before blasting.

7. All major blasting operations shall be monitored by an approved seismograph located at the nearest structure within 600 feet of the blasting operation. All daily seismograph reports shall be maintained by the blaster for three years from the blasting.

Excavation/Haul Truck Equipment

Loose rock would be loaded onto haul trucks using front-end loaders. Trucks would then transport collected material to the primary plant. If the distance from the quarry area to the primary plant were relatively far, a portable jaw crusher may be used in the quarry, and the rock would then be moved to the primary plant by conveyor. Noise measurements of excavation equipment were conducted at a similar facility, Superior Ready Mix Mission Gorge facility.

Aggregate Crushing and Processing

Several different types of equipment would be used during rock processing and recycling, including static screens (“grizzlies”) during the initial separation of oversized materials, jaw and

cone crushers, screening crushers, screens, washing screws, and materials transportation belt systems.

The secondary plant would consist of two to three secondary crushers, two to three sizing screens, and conveyor belts. Finished aggregate would be stockpiled and/or stored in overhead loading bins. The stock piles would be approximately 35 feet high. The aggregate would then be loaded onto trucks with either a front-end loader or from overhead loading bins, and material would be hauled off site.

Concrete Batch Plant

As previously stated, a concrete batch plant would be located in the Project impact footprint. The plant would most likely have conveyor belts within tunnels under the stockpiles of aggregate for direct loading of the concrete batch plant. The aggregate, cement, and water would be weighed and then discharged into a mixer drum on a ready-mix concrete truck. The loudest noise associated with such a plant would typically be associated with the trucks. Noise measurements of similar equipment were conducted at a similar facility, Superior Ready Mix Mission Gorge facility.

Asphaltic Concrete Plant

An asphaltic concrete plant also would be located at the site. The plant would most likely have conveyor belts within tunnels under the stockpiles of aggregate for direct loading. The plant may include a secondary impact crusher and steel screen for materials processing. The processing plant would discharge various types of aggregate into a heated drum where the aggregate would be mixed with tar and other materials to make asphaltic concrete in a pug mill. The noise associated with this type of plant would primarily be due to the burner/dryer and would be discharged into one particular direction.

Recycled Materials Processing

Recycled materials will be processed in a plant similar to the basic aggregates material processing which would include a jaw crusher, steel screens, cone crusher, and impact crushers. Unlike the normal aggregates processing the recycle crusher equipment footprint may be occasionally shifted due to operational requirements. A Caterpillar XQ400 generator may be used to provide power for the processing plant (see attached data sheet). The recycle crusher and screens are not as loud as the same equipment used in processing raw granite.

If the site receives a large amount of recycling materials that does not classify directly into the current recycling piles, it may be separately stacked in an excavation area that is not scheduled for immediate work. This material may be separately partially or fully recycled with a portable plant adjacent to the stack area.

5.3.1 Noise Source Measurements

Noise measurements of similar equipment were conducted at a similar facilities including:

1. Superior Ready Mix Mission Gorge facility
2. Superior Ready Mix Lakeside facility
3. Vulcan Materials Oxnard facility
4. Vulcan Materials Yucaipa facility

The noise measurements were taken at typical distances of 50 feet or less due to other on-site sources creating noise in the area as part of the required operations. Some equipment such as a recycle jaw crusher and a screen cannot be fully separated due to immediate proximity; the actual measurement is divided into percentages based on perception during the measurement and the noise (based on percentage of total) shown as separate details. Likewise the future plant will utilize a stacked synthetic screen system where no actual measurements were made of a stacked screen. Screen noise comes from both the actual screen and from the hopper below the screen. To estimate the noise from a stacked screen the individual noise level was reduced by 20 percent and two 80 percent levels combined. The actual measurements were converted to S_{WL} noise levels for the purpose of presentation and analysis. Table 18 shows the noise source data for such equipment.

Table 18
NOISE SOURCE DATA

Equipment	Noise Levels in dB[1] Measured at Octave Frequencies in Hertz (Hz)									Overall Noise Level (dBA)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
Raw Materials										
Jaw Crusher	108.2	115.4	117.1	112 .0	114.5	113.0	111.5	107.3	99.8	118.0
Cone Crusher	112.5	113.2	112.6	105.7	109.0	110.8	115.7	113.7	109.4	117.5
Impact Crusher	107.4	104.6	100.8	98.2	99.4	94.8	95.6	94.3	96.1	103.0
Synthetic Screen	106.7	100.5	104.3	105.3	105.5	101.5	100.3	98.5	97.8	108.0
Steel Screen	78.8	89.0	99.4	107.4	111.6	115.8	115.3	111.5	103.1	120.4
Recycle and Asphaltic Materials										
Jaw Crusher	115.2	103.1	106.6	100.3	93.0	86.9	82.9	83.0	100.2	101.0
Cone Crusher	91.2	92.3	93.6	97.8	97.0	95.7	94.8	92.5	89.0	101.4
Impact Crusher	107.4	104.6	100.8	98.2	99.4	94.8	95.6	94.3	96.1	103.0
Steel Screen	114.0	101.9	105.4	99.1	91.8	85.7	81.7	81.8	99.0	99.8
Generator	97.0	98.9	79.7	86.0	87.6	84.7	84.1	75.6	67.5	99.7
Excavation Equipment										
D9 as a Line Source	130.0	125.5	114.5	116.5	113.5	112.5	118.5	102.5	96.5	121.2
Loader as a Line Source	109.2	121.6	109.8	105.9	103.1	118.9	106.6	99.9	95.5	119.4
Rock Drill	128.3	124.7	125.3	120.8	121.4	117.8	115.3	110.6	103.8	123.3

[1] Based on Sound Power Levels (S_{WL})
[2] This high level of low frequency noise is attributed to the nearby crushers.

As shown in Table 18, it is possible for on-site equipment noise levels to exceed 75 dBA L_{EQ} or 60 CNEL at adjacent property lines and 60 dBA L_{EQ} at sensitive habitat areas. **Impact: Potentially Significant**

5.4 Design Considerations and Mitigation Measures

Normal barrier modeling techniques for the crusher planning were considered and rejected due to the size of the actual noise sources and concerns whether a barrier could be erected to provide sufficient noise control to allow accurate modeling. Therefore, an existing crusher was fitted with a test barrier system to provide an accurate forecast of specific noise level reduction for an in-place crusher.

The data for the cone crusher with and without the noise barrier and the calculated noise barrier reduction is shown below in Table 19.

Table 19
CONE CRUSHER BARRIER REDUCTION

Equipment	Noise Levels in dB[1] Measured at Octave Frequencies in Hertz (Hz)									Overall Noise Level (dBA)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
Cone Crusher	112.5	113.2	112.6	105.7	109	110.8	115.7	113.7	109.4	117.5
Cone Crusher w/ Barrier	112.4	100.1	97.3	97.8	98.1	96.7	93.6	87.8	82.5	101
Reduction	0.1	13.1	15.3	7.9	10.9	14.1	22.1	25.9	26.9	16.5

[1] Based on Sound Power Levels (S_{WL})

The following measures would be required as part of the facilities operation:

1. No jaw crusher shall be operated closer than 350 feet from the closest property line or habitat location.

2. No screen shall be operated closer than 165 feet from the closest property line or habitat location.

3. No vertical crusher shall be operated closer than 85 feet from the closest property line or habitat location.

4. All cone crushers used in the aggregate crushing process shall be shielded with noise control barriers: the barriers shall start at ground level and extend to at least a minimum of 1-foot higher than the direct line of sight between any portion of the shielded equipment and any suitable habitat areas to the east of the site.

5. All vertical crushers used in the aggregate crushing process shall be shielded with noise control barriers: the barriers shall extend to the ground or at least 2 feet below the crusher if it is an elevated unit and extend to at least a minimum of 1 foot higher than the direct line of sight between any portion of the shielded equipment and any suitable habitat areas to the east of the site.

6. All materials screening for aggregates shall use synthetic screens (recycling screens may use steel screens).

7. If a cone crusher is used in the Asphaltic Concrete Plant, it shall be shielded with a barrier as described in 4 above.

8. If a portable plant is used for occasional processing of recycled materials the unit shall only be used in the area south of the main plant. The unit shall never be positioned closer than 500 feet to the eastern or southern excavation boundary or the southern boundary of the normal equipment areas to control additional noise impacts to the east.

5.5 Mitigated Noise Impacts

This section discusses the impacts with the appropriate crusher noise shielding (as described above) and the use of all synthetic screens at the facility, and the potential of noise control along the southern property boundary if these locations are developed with NSLUs in the future.

5.5.1 Operational Noise

The operating conditions analyzed below are all considered to be conservative scenarios, which would entail all equipment operating simultaneously at the current ground level. The actual plant operations would rarely entail having all equipment operating simultaneously. In addition, the Project impact footprint would be mined, which would create slopes along the northern and eastern boundaries, as well as portions of the southern and western boundaries (refer to Figure 3), as opposed to current ground level. The placement of noise sources below current ground level would ultimately reduce noise impacts due to shielding of the off-site line-of-sight views.

Site noise operation conditions were considered for the noise analysis, including:

- Condition 1: Only the plant equipment in operation

- Condition 2: Material extraction only at a property boundary with a large nearby habitat area (southern portion of the site)

- Condition 3: Plant equipment and material extraction

A noise impact contour map for the conservative composite noise scenario (Condition 3) is provided as Figure 5 (this contour map shows all of the calculated noise levels for extraction areas in use as a hypothetical conservative scenario)

In addition to the noise impact area contours, a series of specific calculation receiver locations are provided in the Project impact footprint. These receivers are numbered R 1 through R 13, starting with receiver R 1 located to the west of the equipment. The remaining receivers continue in a clockwise manner around the periphery of the Project impact footprint. The receiver locations are shown on Figure 5. Table 20 provides the calculated noise levels at each receiver for the three site operation conditions.

Table 20
ANALYZED RECEIVER LOCATIONS WITH ALL PLANT EQUIPMENT IN OPERATION

Receiver No.	Operating Condition Noise Level (dBA L_{EQ})		
	Condition 1: Plant Only	Condition 2: Southern Quarry Operation	Condition 3: Plant Plus Southern Quarry Operation
R 1	68.1	49.1	68.1
R 2	64.9	41.7	64.9
R 3	63.8	37.1	63.8
R 4	57.6	27.6	57.6
R 5	69.1	40.4	69.1
R 6	64.7	38.5	64.7
R 7	53.8	42.4	54.1
R 8	38.5	51.5	51.7
R 9	38.4	62	62
R 10	34.9	75	75
R 11	36.7	38.8	40.8
R 12	50.1	36.7	50.2
R 13	57.3	39	57.3

Table 21 shows the approximate noise contour distance[8] for the extractive equipment when operating with a clear line-of-site view of the calculated receiver.

Table 21
TYPICAL NOISE LEVELS AT SPECIFIED DISTANCES FROM CENTER OF EXTRACTION AREAS

Noise Level (dBA L_{EQ} and CNEL)	Distance in Feet
75	72
70	125
65	217
60	385
55	656
50	1,132

5.5.2 Noise Sensitive Land Uses

If residences were to be developed within 385 feet of the Project impact footprint area of current or future planned extraction, noise impacts from the Project could be significant. It should be noted that this rural residential development represents a conservative scenario in that other types of development that may be constructed adjacent to the Project impact footprint (e.g., commercial, industrial) have higher noise thresholds (refer to Table 4).

[8] Per discussion in Section 5.1, the CNEL distances presented in Table 25 assume a specific operating period. The extension of this operating period would extend the CNEL distances listed in Table 25.

However, it should be noted that many adjacent parcels are 20-acre lots, and are unlikely to be subdivided for residential use based on the new 2020 County planning guidelines. As such the lots all have more than 10 acres of land suitable for exterior use at less than 60 CNEL even when excavation is occurring adjacent the property line. As noted above, if excavation occurs within 72 feet of a property line, a 10-foot high noise control barrier would be required to control noise to less than 75 dBA L_{EQ}. This is not a permanent noise control barrier; it is only a temporary requirement for excavation within 72 feet of an occupied residential land use. The barrier does not have to extend for the full property line length, it only needs to break the line of sight for any operational locations for a distance of 72 feet from the equipment to the property line. With the installation of a 10-foot high noise barrier as described, the property line noise impacts would be less than 75 dBA L_{EQ}.

Mitigation Measure

Excavation within 72 feet of the property line of a developed residence requires a temporary 10-foot high noise control barrier. The barrier must extend beyond the operational locations to break the line of sight for any location on the NSLU within 72 feet of the equipment operations. **Mitigated Impact: Less than Significant.**

5.5.3 Sensitive Species

The on-site non-transportation noise sources, including the central plant equipment, would generate noise in excess of the 60 dBA L_{EQ} threshold for sensitive wildlife species throughout much of the Project impact footprint periphery.

Material extraction would not occur on the entire periphery of the Project impact footprint at the same time; instead, it is anticipated that only a portion of the Project impact footprint would be quarried at any given time. In addition, as materials are extracted over time from the Project impact footprint, impacts to off-site areas would be reduced due to the noise shielding provided by the quarry slopes created during the materials extraction process.

Noise contours for a single, conservative operation condition were generated (refer to Figure 5). This conservative condition assumes that all plant equipment is in operation and that the extraction area is near the site boundary at the current grade with no additional shielding.

The calculated noise 60 dBA L_{EQ} contour area was used as a basis for analyzing noise impacts to sensitive species in the Biological Technical Report (HELIX 2016).

A mitigation measure (MM 3.4.3f) for potentially significant impacts to sensitive wildlife species is presented in the Biological Technical Report for the Proposed Project (HELIX 2016). **Mitigated Impact: Less than Significant.**

5.5.4 Alternatives

Under the No Project/No Action Alternative, no noise impacts would occur.

Noise impacts and mitigation associated the Extraction to Natural Grade Alternative, Extraction to 50-foot Depth Alternative, and Extraction to 200-foot Depth Alternative would be the same as the Proposed Project during the initial excavation period.

Non-Transportation related noise generated on-site under the No Project/Existing Plan Alternative would occur from operation of the planned Rural Residential and Mixed Industrial land uses. Noise from the rural residences would primarily be associated with operation of heating, ventilation, and air conditioning (HVAC) systems, which would generate noise levels substantially less than those generated by the grading and extractive operations associated with the Proposed Project. Similarly, although noise generated by the industrial land uses would depend on the specific type of industrial use and associated activities, noise levels are anticipated to be less than those from the noise-intensive grading and extractive operations associated with the Proposed Project; however, based on the proximity of land designated for Mixed Industrial uses to land designated for Rural Residential uses, non-transportation-related operational impacts associated with noise from this alternative would be potentially significant.

5.5.5 Design Considerations

The crusher noise barriers and property line noise control barriers (if required due to future development adjacent to the Project extraction area) should be constructed to meet the following minimum requirements:

General Specifications for Sound Attenuation Fence/Wall Construction

A sound attenuation fence/wall should be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue-and-groove and must be at least 1-inch total thickness or have a surface density of at least 3.5 pounds per square foot. Where architectural or aesthetic factors allow, glass or clear plastic may be used on the upper portion, if it is desirable to preserve a view. Sheet metal of 18-gauge (minimum) may be used, if it meets the other criteria and is properly supported and stiffened so that it does not rattle or create noise itself from vibration or wind. Any door(s) or gate(s) must be designed with overlapping closures on the bottom and sides and meet the minimum specifications of the wall materials described above. The gate(s) may be of 1-inch thick or better wood, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated door jambs.

5.6 Conclusions

With mitigation, as described above, the potential noise impacts to NSLUs and sensitive habitat presented in this section would be reduced to less than significant levels.

6.0 LIST OF MITIGATION MEASURES AND DESIGN CONSIDERATIONS

The Project would require noise control barriers and minimum equipment separation distances between homes and NSLUs.

Mitigation

The following mitigation measures would be required as part of the facilities operation:

1. No jaw crusher shall be operated closer than 350 feet from the closest property line or habitat location.

2. No screen shall be operated closer than 165 feet from the closest property line or habitat location.

3. No vertical crusher shall be operated closer than 85 feet from the closest property line or habitat location.

4. All cone crushers used in the aggregate crushing process shall be shielded with noise control barriers: the barriers shall start at ground level and extend to at least a minimum of 1 foot higher than the direct line of sight between any portion of the shielded equipment and any suitable habitat areas to the east of the site.

5. All vertical crushers used in the aggregate crushing process shall be shielded with noise control barriers: the barriers shall extend to the ground or at least 2 feet below the crusher if it is an elevated unit and extend to at least a minimum of 1 foot higher than the direct line of sight between any portion of the shielded equipment and any suitable habitat areas to the east of the site.

6. All aggregate screens shall use synthetic screen elements (note this does not apply to recycled materials which may utilize steel screens).

7. Excavation within 72 feet of the property line of a residential land use requires a temporary 10-foot-high noise control barrier. The barrier must extend beyond the operational locations to break the line of sight for any location on the NSLU within 72 feet of the equipment operations.

8. All sound attenuation fence/walls should be solid and constructed of masonry, wood, plastic, fiberglass, steel, or a combination of those materials, with no cracks or gaps, through or below the wall. (Project Note: conveyor belting is an excellent noise shielding material to allow a flexible barrier or provide lower skirts). Any seams or cracks must be filled or caulked. If wood is used, it can be tongue-and-groove and must be at least 1-inch total thickness or have a surface density of at least 3.5 pounds per square foot. Any door(s) or gate(s) must be designed with overlapping closures on the bottom and sides and meet the minimum specifications of the wall materials described above. The gate(s) may be of 1-inch thick or better wood, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated door jambs.

9. If a cone crusher is used in the Asphaltic Concrete Plant, it shall be shielded with a barrier as described in 4 above.

10. If a portable plant is used for occasional processing of recycled materials the unit shall only be used in the area south of the main plant. The unit shall never be positioned closer than 500 feet to the eastern or southern excavation boundary or the southern boundary of the normal equipment areas to control additional noise impacts to the east.

7.0 CERTIFICATION

This report is based on the related Project information received and measured noise levels, and represents a true and factual analysis of the acoustical impact issues associated with the proposed Otay Hills Construction Aggregate and Inert Debris Engineered Fill Operation project.

This report was prepared by Charles Terry, County-approved CEQA Consultant for Acoustics and Noise.

Charles Terry
Principal Specialist
Noise, Acoustics & Vibration

8.0 REFERENCES

Bioacoustics Research Team

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