HELIX Environmental Planning

Cottonwood Sand Mine Project

Acoustical Site Assessment Report and Addendum

PDS2018-MUP-18-023; PDS2018-RP-18-001;
PDS2018-ER-18-19-007

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Addendum: January 31, 2023

Prepared for:

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Subject: Addendum to the Cottonwood Sand Mine Project Draft Environmental Impact Report Appendix F Acoustical Site Assessment Report

This addendum addresses revisions and clarifications to the Acoustical Site Assessment Report prepared for the Cottonwood Sand Mine Project (project), included as Appendix F to the Draft Environmental Impact Report (EIR; State Clearinghouse No. 2019100513) circulated for public review from December 16, 2021, to February 28, 2022. The analysis within that report found that with the implementation of mitigation measures, the project met the established thresholds of significance and no significant impact would occur as a result of project implementation. Comments received during public review of the Draft EIR challenged assumptions and methods used in the Acoustical Site Assessment Report.

This addendum addresses the comments and includes additional refinements to the assumptions.

PROJECT DESCRIPTION

The project proposes to convert two golf courses to a sand mining operation that would be conducted in three phases over 10 years. The project's mining operations would extract, process, and transport sand using conventional earth moving and processing equipment. Approximately 4.3 million cubic yards (CY; 6.40 million tons) of material are proposed to be extracted. Mining and extraction activities are expected to produce approximately 3.8 million CY (5.7 million tons) of sand and gravel for market use. Extraction operations would be limited to a maximum production of 380,000 CY (570,000 tons) of construction grade aggregate (sand) per calendar year, with a 10 percent waste factor from the total amount extracted that includes wash fines and materials undesirable for processing.

Since the release of the Draft EIR, the project description has been updated to include backfilling of the site in order to achieve final elevations. Backfilling would be accomplished using a combination of wash fines and overburden produced from the mining operations and imported fill. Approximately 2.5 million CY would be needed to be imported to the site to fulfill the backfill requirements. The imported material would consist of inert debris transported by trucks to the project site at an estimated rate of 250,000 CY per year for the 10-year duration of mining activities. Backfill material import operations would occur from 9:00 a.m. to 3:30 p.m. Monday through Friday to avoid peak traffic periods. In addition to the 88 trucks necessary for daily export of the saleable material, 58 trucks are assumed to commute to the mining site daily for the import of backfill material.

CHANGES TO OPERATIONAL MODELING ASSUMPTIONS

On-Road Vehicles

Mining operation noise levels were re-calculated to account for additional truck trips required for the import of backfill material. Based on updated estimates provided by EnviroMINE, the total imported backfill is expected to be 2.5 million cubic yards, which would require an additional 58 truckloads of import per day and result in a total (import and export) of 146 truckloads per day, or 23 truckloads per hour between the hours of 9:00 a.m. and 3:30 p.m.

On-site Equipment

Mining operation noise levels were re-calculated to also account for a second on-site conveyor belt that would be used to transport backfill materials to reclamation areas. In addition to the low rumbling noise generated by the conveyor as it operates, noise would result from the backfill material (assumed to be gravel) falling off the end of the conveyor into a pile as it reaches its destination. Though the belt itself may vibrate some when operating, the level of vibration transferred to the ground would be very low, especially considering that the belt is elevated off the ground and only connected to the ground by mounts. This negligible level of vibration would not have the potential to impact off-site properties.

A dozer would be used for backfilling activities; however, a dozer was previously considered in the noise modeling for excavation area grading. This same dozer in the model is representative of a dozer that would be used for backfilling activities as a given receptor would not be exposed to a dozer associated with the excavation area grading and a dozer associated with backfilling activities at the same time based on distance between the project's subphase areas.

Updated Mining Operation Noise Impacts

The updated estimated maximum noise levels at the exterior use areas of the 14 receivers from processing plant, grading, material extraction, backfilling, and on-road hauling activities are presented in Table A, *Mining Operation Noise Levels*.

Table A
MINING OPERATION NOISE LEVELS

Receiver Area	Maximum Noise from Processing Plant (dBA/CNEL)	Maximum Noise from Material Extraction and Grading (dBA/CNEL)	Maximum Noise from On-road Haul Trucks (dBA/CNEL)	Maximum Combined Noise (dBA/CNEL)	Exceed 60 dB CNEL Limit?
Residential Group 1	35.2/29.9	69.6/65.8	57.5/51.8	69.9/**66.0**	**Yes**
Residential Group 2	39.0/33.7	68.8/65.0	59.5/53.8	69.3/**65.3**	**Yes**
Residential Group 3	40.0/34.7	68.5/64.7	59.0/53.3	69.0/**65.0**	**Yes**
Residential Group 4	45.8/41.1	68.1/64.3	59.4/53.7	68.7/**64.7**	**Yes**
Residential Group 5	49.9/44.8	67.1/63.3	56.4/50.7	67.5/**63.6**	**Yes**
Residential Group 6	46.3/40.9	46.8/43.0	42.4/36.7	50.3/45.7	No
Residential Group 7	49.6/44.3	52.7/48.9	42.4/36.7	54.7/50.4	No
Residential Group 8	44.2/38.9	66.1/62.3	37.4/31.7	66.1/**62.3**	**Yes**
Residential Group 9	50.6/45.2	53.5/49.7	38.9/33.2	55.4/51.1	No
Residential Group 10	48.7/44.1	70.5/66.7	41.4/35.7	70.5/**66.7**	**Yes**
Residential Group 11	38.5/33.2	73.7/69.9	42.8/37.1	73.7/**69.9**	**Yes**
Isolated Residence 1	58.2/52.8	61.1/57.3	52.1/46.4	63.2/58.9	No
Isolated Residence 2	37.0/32.0	66.0/62.0	29.0/23.3	66.0/**62.0**	**Yes**
Isolated Residence 3	37.0/32.0	67.0/63.0	33.0/27.3	67.0/**62.0**	**Yes**
Isolated Residence 4	42.4/37.2	61.2/57.7	37.8/32.1	61.3/57.8	No
Hilton Head County Park	36.0/30.8	55.9/52.1	42.1/36.4	56.1/52.2	No
ADEONA Healthcare	45.5/40.4	64.7/60.9	40.6/34.9	64.8/**60.9**	**Yes**

CNEL = Community Noise Equivalent Level; dB = decibel; dBA = A-weighted decibel

As shown in Table A, noise at 11 receiver locations exceed the 60 dB Community Noise Equivalent Level (CNEL) threshold, and noise impacts from mining activities to exterior use areas at NSLUs are assessed as potentially significant, consistent with the analysis provided in the Draft EIR. The project would implement mitigation measure NOI-1, presented in the Draft EIR, to reduce noise levels from mining activities at occupied properties near the project site.

The updated estimated maximum noise levels with implementation of mitigation measure NOI-1 are presented in Table B, *Mitigated (8-foot Barrier) Mining Operation Noise Levels,* and Table C, *Mitigated (12-foot Barrier) Mining Operation Noise Levels.*

Table B
MITIGATED (8-FOOT BARRIER) MINING OPERATION NOISE LEVELS

Receiver Area	Updated Maximum Combined Noise (CNEL)	Exceed 60 dB CNEL Limit?
Residential Group 1	**60.7**	**Yes**
Residential Group 2	**60.5**	**Yes**
Residential Group 3	**62.3**	**Yes**
Residential Group 4	**60.6**	**Yes**
Residential Group 5	59.2	No
Residential Group 8	58.6	No
Residential Group 10	**60.6**	**Yes**
Residential Group 11	**64.1**	**Yes**
Isolated Residence 2	51.1	No
Isolated Residence 3	58.0	No
ADEONA Healthcare	53.8	No

CNEL = Community Noise Equivalent Level; dB = decibel

Table C
MITIGATED (12-FOOT BARRIER) MINING OPERATION NOISE LEVELS

Receiver Area	Updated Maximum Combined Noise (CNEL)	Exceed 60 dB CNEL Limit?
Residential Group 1	57.3	No
Residential Group 2	58.1	No
Residential Group 3	60.0	No
Residential Group 4	58.4	No
Residential Group 10	57.0	No
Residential Group 11	60.0	No

CNEL = Community Noise Equivalent Level; dB = decibel

As shown in Tables B and C, mitigation measure NOI-1, as presented in the Draft EIR, reduces noise levels to below the 60 dB CNEL threshold under the updated mining operations scenario.

Updated Combined and Cumulative Off-site Noise Impacts

Combined Operation and Existing Ambient Noise Impacts

Noise associated with the project's updated operations was combined with existing noise levels associated with traffic along Willow Glen Drive to determine noise impacts to NSLUs anticipated to be subject to noise from both sources. Modeled receivers were those within residential groups 1 through 7, as well as at Hilton Head County Park and the isolated residence north of Willow Glen Drive (Isolated Residence 1). Table D, *Existing Plus Unmitigated Project Noise Levels*, presents the noise levels for the existing traffic along Willow Glen Drive in combination with the proposed project's updated unmitigated noise levels.

Table D
EXISTING PLUS UNMITIGATED PROJECT NOISE LEVELS

Receiver Area	Existing CNEL	Existing + Project CNEL	Increase CNEL	Direct Impact?[1]
Residential Group 1	63.8	68.0	4.2	**Yes**
Residential Group 2	65.2	68.3	3.1	**Yes**
Residential Group 3	65.4	68.2	2.8	No
Residential Group 4	65.6	68.2	2.6	No
Residential Group 5	59.4	65.0	5.6	**Yes**
Residential Group 6	40.1	46.8	6.7	No[2]
Residential Group 7	45.5	51.6	6.1	No[2]
Isolated Residence 1	52.8	59.9	7.1	No[2]
Hilton Head County Park	45.4	53.0	7.6	No[2]

[1] A direct impact would occur if the project results in an increase of 3 dB CNEL above existing conditions and noise levels exceed 60 dB CNEL.
[2] While the Project would result in noise level increases of greater than 3 dB CNEL, overall noise levels would remain below 60 dB CNEL; therefore, no impact would occur.
CNEL = Community Noise Equivalent Level

As shown in Table D, noise associated with the proposed project would result in an increase of more than 3 dB CNEL when noise levels exceed 60 dB CNEL at receivers within residential groups 1, 2, and 5; therefore, noise impacts associated with the combination of the proposed project's updated operations and existing noise levels associated with traffic along Willow Glen Drive would be considered potentially significant at these three locations, consistent with the analysis provided in the Draft EIR.

Table E, *Existing Plus Mitigated Project Noise Levels*, presents the noise levels for the existing traffic along Willow Glen Drive in combination with the proposed project's updated mitigated noise levels.

Table E
EXISTING PLUS MITIGATED PROJECT NOISE LEVELS

Receiver Area	Existing CNEL	Existing + Project CNEL	Increase CNEL	Direct Impact?[1]
Residential Group 1	63.8	64.7	0.9	No
Residential Group 2	65.2	66.0	0.8	No
Residential Group 3[2]	65.4	66.5	1.1	No
Residential Group 4[2]	65.6	66.4	0.8	No
Residential Group 5	59.4	62.3	2.9	No

[1] A direct impact would occur if the project results in an increase of 3 dB CNEL above existing conditions and noise levels exceed 60 dB CNEL.
[2] Although a direct impact was not identified for residential groups 3 or 4 under this threshold, a potentially significant impact was identified for residential groups 3 and 4 under the exterior use area noise threshold (Impact N-1) and residential groups 3 and 4 are therefore subject to mitigation measure NOI-1. Mitigated noise levels for residential groups 3 and 4 are presented here for informational purposes.
CNEL = Community Noise Equivalent Level

As shown in Table E, noise associated with the proposed project would not result in a 3 dB CNEL increase when noise levels exceed 60 dB CNEL at any of the modeled receiver locations, and impacts would be less than significant, consistent with the analysis provided in the Draft EIR.

Cumulative Off-site Impacts

Noise associated with the project's updated operations was combined with cumulative project traffic along Willow Glen Drive to determine noise impacts to NSLUs anticipated to be subject to noise from the cumulative sources. As shown in Table F, *Existing Plus Cumulative Plus Unmitigated Project Noise Levels,* the project's updated operational noise combined with cumulative project traffic noise would result in an increase of 3 dB CNEL or more compared to existing conditions at receivers in residential groups 1, 2, 3, and 5, where noise levels would exceed 60 dB CNEL. Therefore, cumulative impacts would occur at these locations. In addition, because the project would result in more than a 1 dBA increase over existing plus cumulative conditions at these same receiver locations, impacts are considered cumulatively considerable. Cumulative off-site noise impacts are identified as cumulatively significant, consistent with the analysis included in the Draft EIR.

Table G, *Existing Plus Cumulative Plus Mitigated Project Noise Levels*, presents noise levels associated with the project's updated mitigated operational noise combined with cumulative project traffic noise along Willow Glen Drive. As shown in Table G, the project's updated operational noise combined with cumulative project traffic noise would result in an increase of 3 dB CNEL compared to existing conditions at the receiver in residential group 5, where noise levels would exceed 60 dB CNEL. Therefore, a cumulative impact would occur at this location. In addition, because the updated project would result in more than a 1 dBA increase over existing plus cumulative conditions at this same receiver location, impacts are considered cumulatively considerable.

Mitigation measure NOI-1 presented in the Draft EIR required an 8-foot barrier between project excavation activities and NSLUs within residential group 5. Due to the cumulative impact identified herein at residential group 5, a 12-foot barrier is now required between project excavation activities and NSLUs within residential group 5. The provision of a 12-foot barrier instead of an 8-foot barrier would reduce the increase in noise from project's updated operational noise combined with cumulative project traffic noise to less than 3 dB CNEL. Therefore, the updated project, as mitigated through revised mitigation measure NOI-1, would not result in a cumulative noise impact.

Table F
EXISTING PLUS CUMULATIVE PLUS UNMITIGATED PROJECT NOISE LEVELS

Receiver Area	Existing CNEL	Existing + Cumulative CNEL	Existing + Cumulative + Project CNEL	Existing + Cumulative + Project Change from Existing	Existing + Cumulative + Project Cumulative Impact?[1]	Existing + Cumulative + Project Change from Existing + Cumulative	Existing + Cumulative + Project Cumulatively Considerable Impact?[2]
Residential Group 1	63.8	64.1	68.2	4.4	Yes	4.1	**Yes**
Residential Group 2	65.2	65.5	68.4	3.2	Yes	2.9	**Yes**
Residential Group 3	65.4	65.7	68.4	3.0	Yes	2.7	**Yes**
Residential Group 4	65.6	65.9	68.4	2.8	No	2.5	No[3]
Residential Group 5	59.4	59.5	65.0	5.6	Yes	5.5	**Yes**
Residential Group 6	40.1	40.2	46.8	6.7	No	6.6	No[3]
Residential Group 7	45.5	45.6	51.6	6.1	No	6.0	No[3]
Isolated Residence 1	52.8	52.8	59.9	7.1	No	7.1	No[3]
Hilton Head County Park	45.4	45.7	53.1	7.7	No	7.4	No[3]

[1] A cumulative impact would occur if the project would cause: an increase of 10 dB CNEL over existing noise levels, resulting in a combined exterior noise level of 60 dB CNEL or greater; an increase of 3 dB CNEL over existing conditions in the existing plus project plus cumulative scenario if that total is above 60 dB CNEL; or if the project would cause interior noise levels in excess of 45 dB CNEL while also causing an increase at least 3 dB CNEL over existing conditions.

[2] A cumulatively considerable contribution to an identified cumulative impact would occur if the project would add more than 1 dBA to the cumulative noise increase.

[3] While the project would cause a change from the Existing + Cumulative scenario that is greater than 1 dBA, no cumulative impact was identified so the Project's contribution is not cumulatively considerable.

CNEL = Community Noise Equivalent Level

Table G
EXISTING PLUS CUMULATIVE PLUS MITIGATED PROJECT NOISE LEVELS

Receiver Area	Existing CNEL	Existing + Cumulative CNEL	Existing + Cumulative + Project CNEL	Existing + Cumulative + Project Change from Existing	Existing + Cumulative + Project Cumulative Impact?[1]	Existing + Cumulative + Project Change from Existing + Cumulative	Existing + Cumulative + Project Cumulatively Considerable Impact?[2]
Residential Group 1	63.8	64.1	64.9	1.1	No	0.8	No
Residential Group 2	65.2	65.5	66.2	1.0	No	0.7	No
Residential Group 3	65.4	65.7	66.7	1.3	No	1.0	No
Residential Group 4[4]	65.6	65.9	66.6	1.0	No	0.7	No
Residential Group 5	59.4	59.5	62.4	3.0	No	2.9	No

[1] A cumulative impact would occur if the project would cause: an increase of 10 dB CNEL over existing noise levels, resulting in a combined exterior noise level of 60 dB CNEL or greater; an increase of 3 dB CNEL over existing conditions in the existing plus project plus cumulative scenario if that total is above 60 dB CNEL; or if the project would cause interior noise levels in excess of 45 dB CNEL while also causing an increase at least 3 dB CNEL over existing conditions.

[2] A cumulatively considerable contribution to the cumulative impact would occur if the project would add more than 1 dBA to the cumulative noise increase.

[3] While the project would cause a change from the Existing + Cumulative scenario that is greater than 1 dBA, no cumulative impact was identified so the Project's contribution is not cumulatively considerable.

[4] Although a direct impact was not identified for residential group 4 under this threshold, a potentially significant impact was identified for residential group 4 under the exterior use area noise threshold (Impact N-1); therefore, residential group 4 is subject to mitigation measure NOI-1. Mitigated noise levels for residential group 4 are presented here for informational purposes.

CNEL = Community Noise Equivalent Level

Revised Mitigation Measure NOI-1

Per the above discussion of cumulative impacts, mitigation measure NOI-1 presented in the Acoustical Site Assessment Report has been revised to require a 12-foot barrier between excavation activities and NSLUs within residential group 5, instead of an 8-foot barrier. Revisions to the measure are indicated below in ~~strikeout~~/underline format.

NOI-1 Below-Grade Excavation and Noise Barriers: Raw material extraction equipment operating within 400 feet of off-site NSLU useable space areas shall be located at the lowest feasible elevation within the project's excavation areas such that the topography shall provide noise attenuation to off-site properties. To achieve the lowest feasible elevation, initial at-grade excavation activities shall be performed at least 400 feet from off-site NSLU useable space areas, as indicated in Figures 1~~6~~a-c, *Noise Barriers*. Following this initial excavation to the lowest feasible elevation, excavation can extend outward and toward the NSLUs while maintaining the lowest feasible elevation at the active working face where extraction equipment is operating.

For NSLUs located at residential group~~s 5 and~~ 8 (as shown on Figure 5 of the Draft Acoustical Site Assessment Technical Report), ~~as well as~~ Isolated Residence 2, Isolated Residence 3, and the ADEONA Healthcare facility, an 8-foot-high noise barrier, constructed to the specifications identified below, shall be provided between excavation activities and the off-site NSLUs, when excavation is occurring within 400 feet of each location. When mining activities are occurring at distances greater than 400 feet from a given receiver location, a barrier would not be required adjacent to that receiver location. The barriers shall be located as shown on Figure 1~~6~~a-c and break the line of sight between the excavation activities and receivers. For the barrier adjacent to residential group~~s 5 and~~ 8, the required barrier height (8 feet) shall be measured relative to the adjacent project site property line elevation. If the barrier is constructed at a location with an elevation lower than that of the adjacent project site property line, the total barrier height would be greater than the required barrier height in order to provide adequate noise attenuation (e.g., if the barrier with a required height of 8 feet is to be located at a surface elevation 5 feet below the adjacent project site property line elevation, the total barrier height would be 13 feet).

For NSLUs located at residential groups 1, 2, 3, 4, 5, 10, and 11 (as shown on Figure 5 of the Draft Acoustical Site Assessment Technical Report), a 12-foot-high noise barrier, constructed to the specifications identified below, shall be provided between excavation activities and the off-site NSLUs, when excavation is occurring within 400 feet of each location. When mining activities are occurring at distances greater than 400 feet from a given receiver location, a barrier would not be required adjacent to that receiver location. The barriers shall be located as shown on Figure 1~~6~~a-c and break the line of sight between the excavation activities and receivers. For the barriers adjacent to residential groups 1, 2, 3, ~~and~~ 4, and 5, the required barrier height (12 feet) shall be measured relative to the adjacent project site property line elevation. If the barrier is constructed at a location with an elevation lower than that of the adjacent project site property line, the total barrier height would be greater than the required barrier height in order to provide adequate noise attenuation (e.g., if the barrier with a required height of 12 feet is to be located at a surface elevation 5 feet below the adjacent project site property line elevation, the total barrier height would be 17 feet).

The noise barriers must be solid. They can be constructed of soil (in the form of a berm or stockpile), masonry, wood, plastic, fiberglass, steel, or a combination of those materials, as long as there are no cracks or gaps, through or below the walls. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one-inch total thickness or have a density of at least 3.5 pounds per square foot. 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 wood with a thickness of at least one inch, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated doorjambs. Stockpiles must be continuous and maintain the required height along their entire length.

PROVISION OF ADDITIONAL AMBIENT NOISE DATA

Public comments provided on the Draft EIR expressed that the project's mining operation noise levels should be compared to pre-existing ambient noise levels. This analysis methodology is identified in the County of San Diego Guidelines for Determining Significance – Noise (County 2009a) and the County of San Diego Report Format and Content Requirements – Noise (County 2009b), as follows, with the italicized text the component of note:

Impacts would be significant if the project's mining operations would:

1. Result in the exposure of any on- or off-site, existing, or reasonably foreseeable future NSLU to exterior or interior noise (including noise generated by the project, together with noise from roads, railroads, airports, heliports, and all other noise sources) in excess of any of the following:
    a. Exterior Locations:
        i. 60 dB CNEL; or
        ii. An increase of 10 dB CNEL over pre-existing noise in areas where ambient noise levels are 49 dB CNEL are less.

As indicated in the guidelines, an increase over pre-existing conditions need only be considered if existing ambient noise levels are 49 CNEL or less. To assess the existing CNEL at receiver locations surrounding the project site, HELIX Environmental Planning, Inc. (HELIX) placed eight Class II sound level meters at locations around the project site (refer to Figure 2, *24-hour Ambient Noise Measurement Locations*) and collected 24-hour measurement data. The data, converted to CNEL, is presented in Table H, *24-hour Ambient Noise Measurement Results.*

Table H
24-HOUR AMBIENT NOISE MEASUREMENT RESULTS

Measurement Location	CNEL
Location 1	50.8
Location 2	57.3
Location 3	55.1
Location 4	53.2
Location 5	64.0
Location 6	77.5
Location 7	53.2
Location 8	59.3

CNEL = Community Noise Equivalent Level

As shown in Table H, the CNEL at each measurement location was above 49 CNEL; therefore, the applicable guideline for determining significance of the project's mining operations noise is comparison to the 60 CNEL threshold, which is the threshold used in the Draft EIR and this addendum.

NOISE IMPACTS TO BIOLOGICAL RESOURCES

The Biological Resources Technical Report prepared by HELIX and included as Appendix C to the Draft EIR (HELIX 2022) provides analysis regarding the effects of construction and operational noise on various sensitive wildlife species, per the County Report Format and Content Requirements – Biological Resources (County 2010). As indicated in the report, construction, mining, and reclamation activities would require the daily use of heavy equipment that would elevate existing noise levels at and around the site. Noise associated with these activities adjacent to active nests could result in adverse indirect impacts to nesting coastal California gnatcatcher, least Bell's vireo, Coopers hawk, red-shouldered hawk, and white-tailed kite, among other nesting bird species. As a result of the increased noise levels, breeding birds may temporarily or permanently leave their territories to avoid disturbances from human activities, which could lead to reduced reproductive success and increased mortality. Potential short term noise impacts would occur incrementally, meaning that not all areas would be impacted at once, as mining activities would begin within Phase 1 and generally progress eastward following completion of earlier phasing. Noise effects would be considered potentially significant if noise levels generated during construction, mining, and/or reclamation activities exceed a level of 60 dBA L_{EQ} or ambient (whichever is greater) adjacent to sensitive nesting bird and raptor species. If construction, mining, and/or reclamation activities occur within 500 feet of coastal California gnatcatcher or least Bell's vireo during their breeding seasons (March 1 to August 15 and March 15 to September 15, respectively) or occur within 300 feet of nesting raptors, effects resulting from noise would be potentially significant. These impacts would be reduced to a less-than-significant level through the implementation of mitigation measures BIO-2, BIO-4, BIO-5, and BIO-7 that are included in the Biological Resources Technical Report.

The mitigation measures prescribe various methods to mitigate the potential impacts that noise would have on sensitive species. Mitigation measures BIO-2 and BIO-4 prescribe pre-construction surveys if clearing and grubbing must occur during the breeding season. If the species are found during the pre-construction surveys, they would be avoided within a buffer of 500feet.Indirect impacts to nesting gnatcatcher, vireo, raptors, and other nesting birds due to noise would be mitigated though the methods prescribed in mitigation measures BIO-5 and BIO-7, which involve pre-construction surveys within the areas potentially impacted by noise and the use of avoidance or temporary noise barriers

if the species are found during pre-construction surveys. Additionally, if noise barriers are used, the type (s) and location(s) of noise barrier(s) shall be provided to the County and Wildlife Agencies along with the associated noise measurements demonstrating compliance with required noise level reductions. With the inclusion of the described mitigation, indirect noise impacts to sensitive species would be less than significant.

CONCLUSION

The revisions and clarifications contained in this addendum result in findings consistent with those disclosed in the Acoustical Site Assessment Report prepared in support of the Draft EIR. With incorporation of revised mitigation measure NOI-1, noise-related impacts remain less than significant, consistent with the findings in the Draft EIR.

Sincerely,

Hunter Stapp
Acoustic Analyst

Charles Terry
Principal Specialist
Noise, Acoustics & Vibration
County-approved Noise Consultant

Attachments:

Figure 1a-c, *Noise Barriers*
Figure 2, *24-hour Ambient Noise Measurement Locations*

REFERENCES

County of San Diego. 2010. County of San Diego Report Format and Content Requirements – Biological Resources. September 15.

2009a. County of San Diego Guidelines for Determining Significance – Noise. January 27.

2009b. County of San Diego Report Format and Content Requirements – Noise. January 27.

HELIX Environmental Planning, Inc. (HELIX). 2022. Biological Resources Technical Report. December.

Cottonwood Sand Mine Project

Jamacha Rd
Hilton Head Pl
Inverary Dr
Sawgrass St
Congressional Dr
Medinah Dr
Hilton Service
Augusta Ct
Hilton Head County Park
Wingfoot Pl
Saint Anne Dr
Royal Saint James Dr
Hilton Head Rd
Mulrfield Dr
Emerald Point Ct
Willow Glen Dr
Cottonwood View Dr
Adeona Healthcare Facility
Palm Vista Ct
Ivanhoe Ranch Rd
Lasven Ct
Heatherwood Dr
Steele Canyon Rd
Jamul Dr
Par Four Dr
Windwood Way
Wildwind Dr

1 2 3 4 5 9 10 11

Project Site
MUP Boundary
Processing Area
Residential Group
8-ft Barrier
12-ft Barrier
400-ft Setback
Easements and Rights-of-way
Stockpiles
San Diego Gas & Electric Towers
Excavation Area
Access Road

0 350 Feet

Source: Aerial (SanGIS, 2017)

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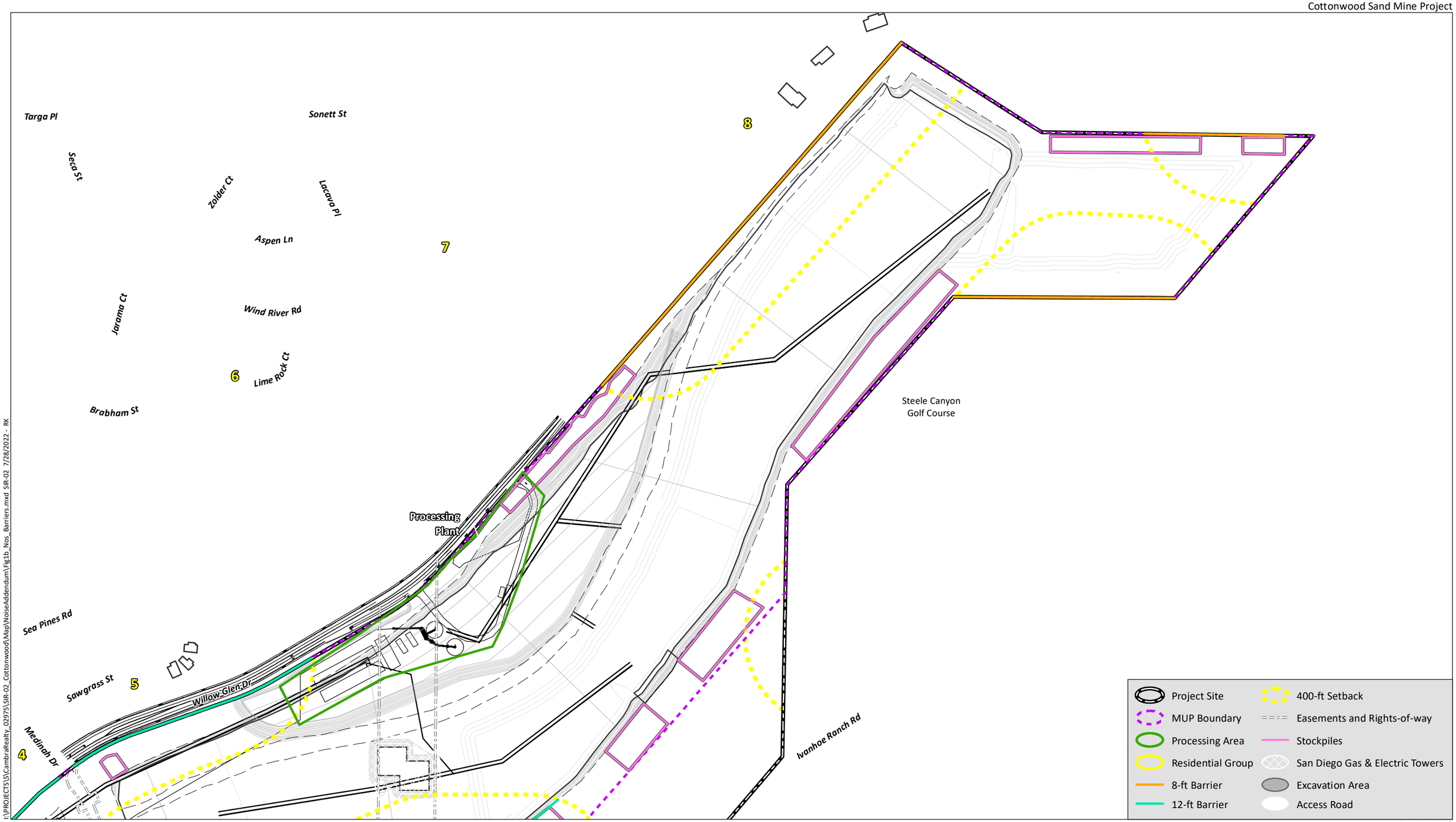
Noise Barriers

Figure 1a



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Source: Aerial (SanGIS, 2017)

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Noise Barriers

Figure 1b

Cottonwood Sand Mine Project

Hilton Head Ct
Inverary Dr
Prince Edward Ct
Sea Pines Rd
Congressional Dr
Sawgrass St
Masters Dr
Augusta Ct
Wingfoot Pl
Hilton Head Rd
Emerald Point Ct
Willow Glen Dr
Ivanhoe Ranch Rd
Cottonwood View Dr
Cottonwood Springs Ln
Palm Vista Ct
Adeona Healthcare Facility
Lasven Ct
Old Schoolhouse Rd
Indian Mills Ln
Jamul Dr
Heatherwood Dr
Par Four Dr
Windwood Way
Slaale Canyon Rd

2
3
4
5
9
10
11

Project Site
MUP Boundary
Processing Area
Residential Group
8-ft Barrier
12-ft Barrier
400-ft Setback
Stockpiles
Easements and Rights-of-way
San Diego Gas & Electric Towers
Excavation Area
Access Road

0 350 Feet

Source: Aerial (SanGIS, 2017)

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Noise Barriers

Figure 1c

Cottonwood Sand Mine Project

24-hour Ambient Noise Measurement Location
Project Site
MUP Boundary
Proccessing Plant
Subphase Areas

Jamacha Way
Targa Pl
Sonett St
Porterfield Pl
Seaal St
Greenwick Rd
Greencrest Dr
Greencrest Ct
Monte View Ct
Mirage Ct
Marlyn Pl
Aspen Ln
Wind River Rd
Via Hacienda
Brabham St
Woodpine Dr
Woodrun Pl
Sea Pines Rd
Via Rancho San Diego
Hilton Head Pl
Hilton Service
Sawgrass St
Congressional Dr
Augusta Ct
Ivanhoe Ranch Rd
Jamacha Rd
Hilton Head Rd
Lord Saint James Dr
Emerald Point Ct
Willow Glen Dr
Cottonwood Springs Ln
Ashley Park Dr
Indian Mills Ln
Wentworth Way
Wentworth Dr
Heatherwood Dr
Steele Canyon Rd
Jamul Dr
Par Four Dr
Greystone Dr
Stonefield Dr

M1
M2
M3
M4
M5
M6
M7
M8

0 700 Feet

Source: Aerial (SanGIS, 2017)

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HELIX Environmental Planning

24-hour Ambient Noise Measurement Locations

Figure 2

Cottonwood Sand Mine Project

Acoustical Site Assessment Report

PDS2018-MUP-18-023; PDS2018-RP-18-001;
PDS2018-ER-18-19-007

Prepared for:

County of San Diego
Planning & Development Services
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La Mesa, CA 91942

November 2021 | 02975.00002.002

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ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
ANSI	American National Standards Institute
CadnaA	Computer Aided Noise Abatement
Caltrans	California Department of Transportation
CNEL	Community Noise Equivalent Level
County	County of San Diego
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
Defra	Department of Environment, Food and Rural Affairs
FHWA	Federal Highway Administration
Hz	Hertz
in/sec	inches per second
kHz	kilohertz
L_{DN}	Day Night sound level
L_{EQ}	time-averaged noise level
LLG	Linscott, Law & Greenspan, Engineers
L_{MAX}	maximum noise level
mPa	micro-Pascal
NSLU	noise sensitive land use
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
SPL	sound pressure level
SR	State Route
S_{WL}	sound power level
TNM	Traffic Noise Model
USDOT	U.S. Department of Transportation

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EXECUTIVE SUMMARY

This report presents an assessment of the potential noise impacts associated with the proposed Cottonwood Sand Mine Project (project). The project proposes to convert two golf courses to a sand mining operation that would be conducted in three phases over 10 years. The project site is located in the unincorporated community of Rancho San Diego in eastern San Diego County (County).

The project would generate noise during operations from mobile off-road equipment for excavation area grading; raw material extraction, loading, and transport; a conveyor belt for material transport; processing plant equipment; on-site haul trucks and associated loading equipment; and on-road haul trucks. Noise associated with operations would exceed County of San Diego noise standards at nearby residential properties, as well as the ADEONA Healthcare facility. The project would implement mitigation measure NOI-1, which would require raw material excavation within 400 feet of off-site noise-sensitive land use useable space areas to occur at the lowest elevation feasible, as well as noise barriers. With implementation of mitigation measure NOI-1, noise generated by the project's mining operations would be in compliance with the County's noise standards, and impacts would be less than significant.

The project would also generate noise during its construction phase, which includes construction of the site access road and Willow Glen Drive improvements, grading of the processing plant pad, and installation of screening berms, the conveyor belt, and the processing plant equipment, as well as demolition of existing on-site structures. Equipment used during each phase of construction would generate noise that would result in less-than-significant impacts without mitigation.

During both construction and operation of the project, vibration levels would be below the applicable criteria, and impacts would be less than significant without mitigation.

Noise generated by the project's mining operations, in combination with existing and cumulative traffic noise along Willow Glen Drive, would result in cumulative impacts under the proposed project's unmitigated scenario. With implementation of mitigation measure NOI-1, however, the project's contribution to cumulative impacts would be reduced to a less-than-significant level.

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1.0 INTRODUCTION

1.1 PROJECT LOCATION

The project is located at 3121 Willow Glen Drive, El Cajon, California in the unincorporated community of Rancho San Diego in eastern San Diego County (County). The site is north of State Route (SR) 94 and east of SR 54 (see Figure 1, *Regional Location* and Figure 2, *Project Vicinity [Aerial Photograph]*). More specifically, the project site is located southeast of Willow Glen Drive, north of Jamul Drive, east of Jamacha Road, and west of Hillsdale Road. Steele Canyon Road bisects the project site from north to south, near the center of the project. Principal site access is from Willow Glen Drive, with regional access from SR 54/Jamacha Boulevard and SR 94/Campo Road.

The approximately 280-acre site is situated within the Sweetwater River valley and in the floodplain of the Sweetwater River, which flows in a northeast-to-southwest direction through the site. Elevations on the project site range from approximately 320 feet above mean sea level (amsl) to 380 feet amsl. Land uses in the project vicinity include residential and rural residential development to the north and south, extractive operations to the east, and an adjacent golf course to the southeast. Open space is present in the hills south, east, and west of the site. A National Wildlife Refuge abuts the western end of the property along the river.

1.2 PROJECT DESCRIPTION

The project proposes to convert two golf courses to a sand mining operation that would be conducted in three phases over 10 years. The project includes the following discretionary actions:

- A Major Use Permit (MUP) PDS2018-MUP-18-023 to allow mining activities on 251.1 acres of the 279.8-acre property; and

- A Reclamation Plan (RP) PDS2018-RP-18-001 to specify the standards to which the site must be reclaimed upon completion of mining activities in accordance with the California Surface Mining and Reclamation Act of 1975 (SMARA).

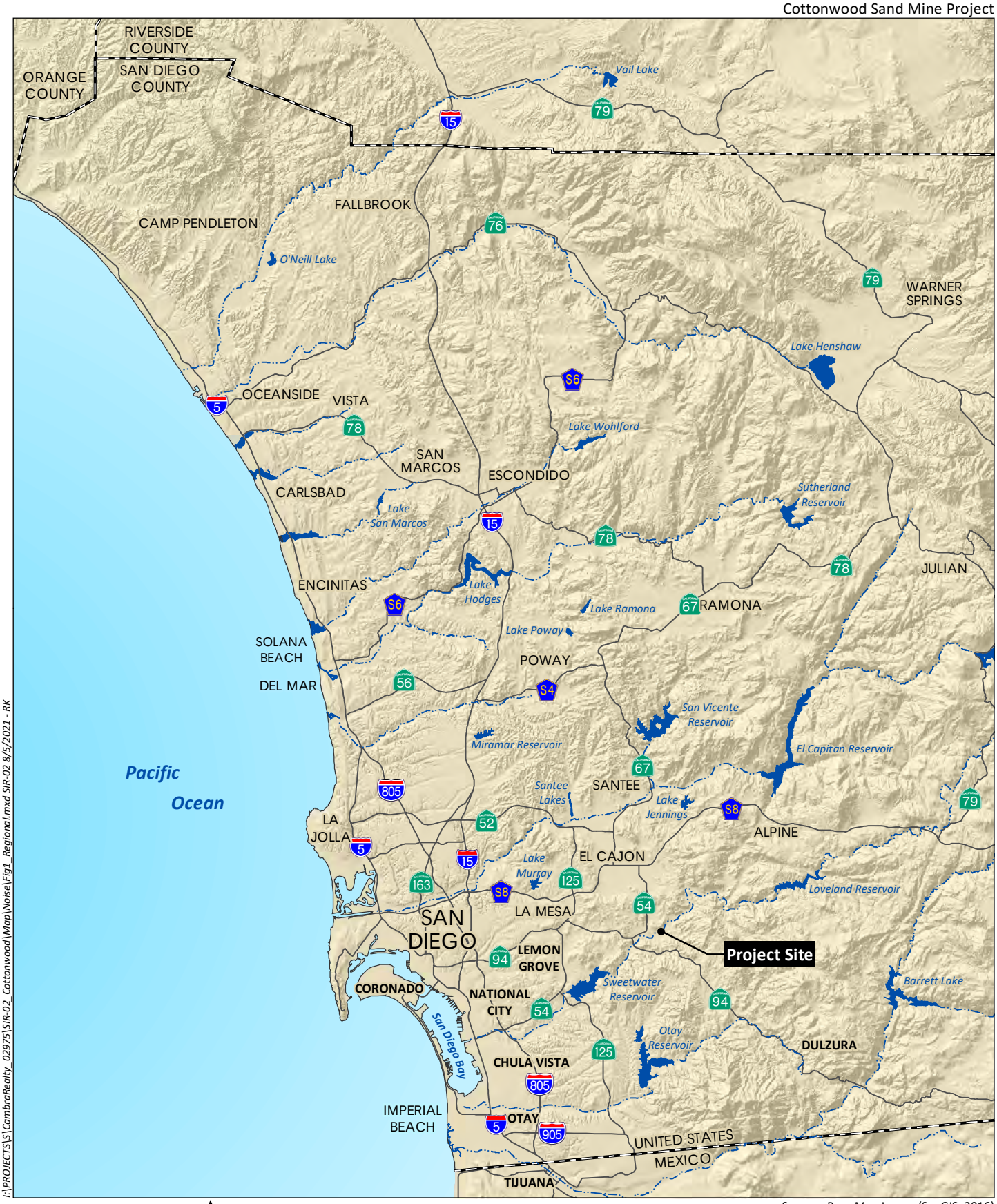
The project's mining operations would extract, process, and transport aggregate using conventional earth moving and processing equipment. Aggregate material extracted from the site would consist primarily of washed sand suitable for Portland cement concrete (PCC), but may also include fill sand, gravel, and rock. Approximately 4.3 million cubic yards (CY; 6.40 million tons) of material are proposed to be extracted., Mining and extraction activities are expected to produce approximately 3.8 million CY (5.7 million tons) of sand and gravel for market use. Extraction operations would be limited to a maximum production of 380,000 CY (570,000 tons) of construction grade aggregate (sand) per calendar year, with a 10 percent waste factor from the total amount extracted that includes wash fines and materials undesirable for processing. Material extracted and processed at the site would be suitable for construction uses and would be available to customers in San Diego County. Approximately 214 acres of the approximately 280-acre site are proposed for extractive use under a phased extraction program. Surface areas not disturbed by mining would be subject to removal of invasive species in the river channel on the southwest portion of the site or be left in their current condition. The existing Sweetwater River channel and the majority of native habitat that currently exists on the site would be retained.

The project would be developed in three continuous mining phases, with sub-phases of less than 30 acres per phase, and a fourth phase for cleanup, equipment removal, and final reclamation (see Figure 3, *Site Plan and Mine Phasing*). Prior to the initiation of Phase 1, pre-mining activities such as the restriping of Willow Glen Drive between Steele Canyon Road and the project ingress driveway to provide Class II buffered bike lanes on both sides of the roadway, improvements to the access point from Willow Glen Drive to the Phase 1 excavation area, and installation of screening landscaping would be implemented. To facilitate deceleration of right-turning vehicles into the project ingress driveway, a dedicated right-turn lane would be constructed, which would serve as the primary access for mining operations, material sales, employees, and vendors. Additionally, a pedestrian pathway would be provided along the northern project frontage/Willow Glen Drive east of Steele Canyon Road to provide pedestrian access within the project vicinity where there are no existing sidewalks. Phase 1 would begin with the placement of the processing plant west of the existing clubhouse adjacent Willow Glen Drive. The plant site would consist of aggregate processing and washing facilities, three settling ponds, loadout area, and support structures and buildings (e.g., scale, kiosk, and office trailer). A portable conveyor line would be installed to transport excavated materials to the processing plant from the excavation areas. The conveyor line would be mobile to provide access within each phase and would be relocated as mining activity is concluded in each phase. The mobile conveyor is proposed to minimize the use of on-site roads to transport excavated material between the plant and excavation areas.

Operations would commence west of the Steele Canyon Road bridge, and then generally proceed in a southwest-to-northeast direction across the project site. Existing vegetation and infrastructure within the golf courses would be removed as mining operations proceed, with approximately 20 to 25 acres subject to mining at any one time. Sand extraction during Phase 1 would be located within the area currently occupied by the closed Lakes Course to the west of Steele Canyon Road. Phase 2 would be located in the center of the site, east of Steele Canyon Road, on the currently operating Ivanhoe Course. Phase 3 mining operations would encompass the remaining acreage of the project site located to the east of Phase 2. Upon approval of the project and MUP, the Ivanhoe Course would be closed; the existing golf clubhouse would be demolished near the end of Phase 2 mining. Phase 4 would consist of removal of the processing plant, grading to final contours, final reclamation and revegetation efforts, cleanup, and equipment removal.

Each phase would include three to four sub-phases that are approximately 30 acres or less each to begin reclamation as soon as possible. Excavation in each sub-phase would be completed before moving the conveyor and excavation equipment to the next sub-phase and reclamation would begin in the completed sub-phase. Topsoil and vegetation stripping would occur in each subsequent sub-phase in advance of completing excavation in the preceding sub-phase. The maximum excavation depth is proposed to be 40 feet below existing land surface. The average depth of excavation is expected to be approximately 20 feet below the existing land surface outside the main Sweetwater River channel. Excavation would not occur within the bottom of the existing low-flow channel in order to retain existing hydrologic characteristics.

Aggregate material would be processed, sized, and stored in stockpiles up to 25 feet in height near the plant. Wash fines produced from the processing plant would be gathered in three settling ponds located near the plant that would be 300 feet long, 50 feet wide, and 10 feet deep. When ponds are cleaned, wash fines (silt, clay, and organic material) would either be sold as a soil amendment or returned to excavation areas that have been completed to be used as backfill or incorporated into the surface.



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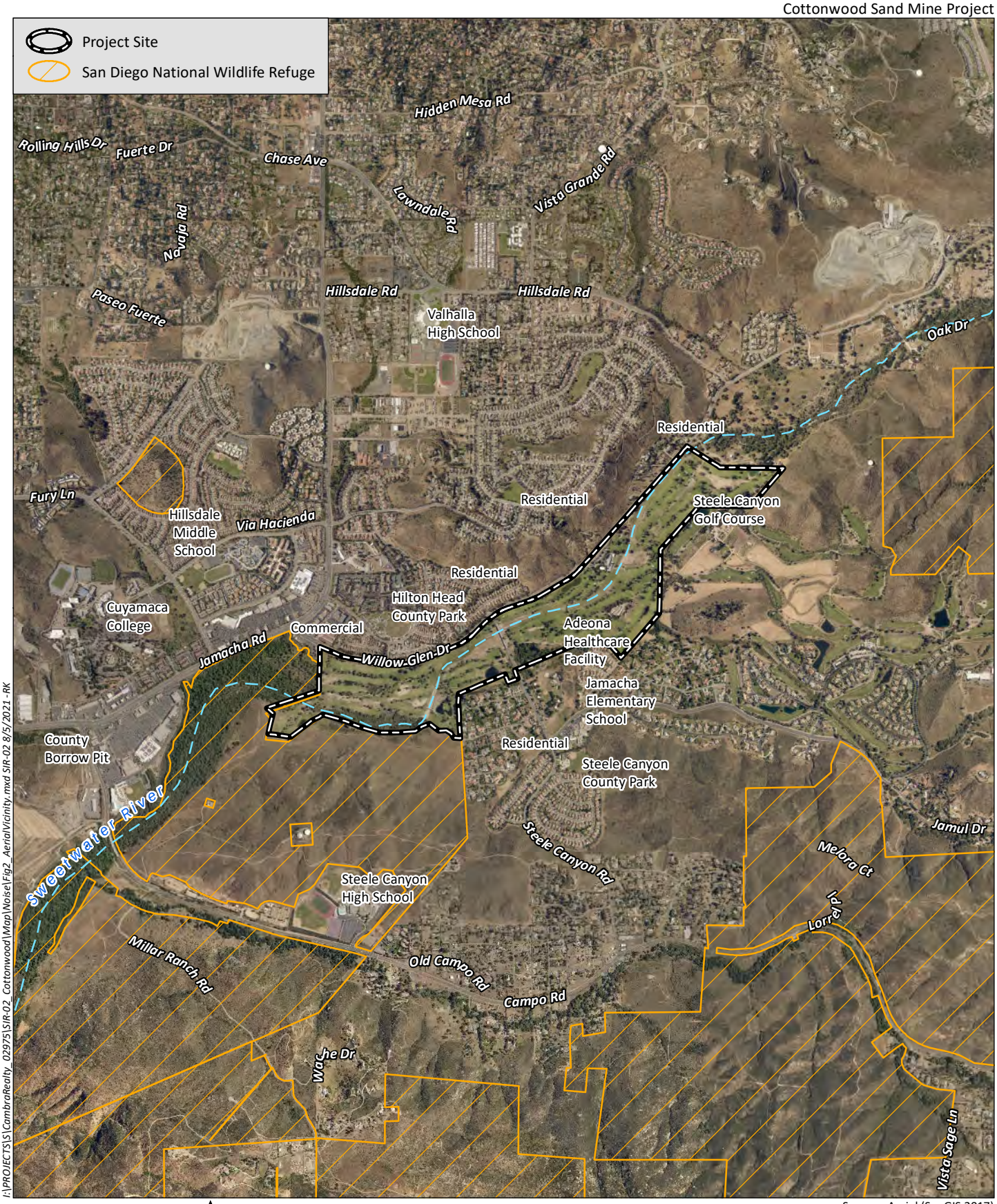
0 8 Miles

Source: Base Map Layers (SanGIS, 2016)

HELIX Environmental Planning

Regional Location

Figure 1



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0 2,500 Feet

Source: Aerial (SanGIS 2017)

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Project Vicinity (Aerial Photograph)

Figure 2

Cottonwood Sand Mine

Project Site
Major Use Permit Boundary
Subphase 1
Subphase 2
Subphase 3
Phase 4/Processing Plant
Easements and Rights-of-way
San Diego Gas & Electric Towers

Jamacha Way
Private Road
Seca Street
Sonett Street
Wind River Road
Brabham Street
Hilton Head Road
Via Hacienda
Jamacha Road
Via Rancho San Diego
Willow Glen Drive
Sweetwater River
Processing Plant
Bridge
Right-of-way
Proposed Permanent
Site Access Point
SDG&E
Easement
Access Road
Heatherwood Drive
Steele Canyon Road
Par Four Drive
Ivanhoe Ranch Road
Cottonwood Springs Lane
Wentworth Drive
Jamul Drive
Greystone Drive

3a
3b
3c
3d
2a
2b
2c
1a
1a-1
1b
1c

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0 700 Feet

N

Source: Aerial (SanGIS 2017)

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Environmental Planning

Site Plan and Mine Phasing

Figure 3

Sand excavation and processing would occur Monday through Friday, between the hours of 7:00 a.m. and 5:00 p.m. Trucking operations for material sales would occur from 9:00 a.m. to 3:30 p.m. Monday through Friday to avoid peak traffic periods. As part of the Willow Glen Drive improvements, a new, paved access ramp off Willow Glen Drive would be provided to the west of the existing driveways that exit to the processing plant as a one-way road. This would serve as the primary access for mining operations, material sales, employees, and vendors. This road would continue to a new egress point in the approximate center of the existing parking lot. A second access road would be installed on the western edge of the project at the intersection of Muirfield Drive and Willow Glen Drive. The new driveway would be restricted to servicing the mining operations.

Areas disturbed by resource extraction would be progressively reclaimed in an ongoing process that commences when mining operations have ceased within a given sub-phase area and continues until all mining-related disturbance is reclaimed and all equipment involved in these operations has been removed. Reclamation would include establishment of all final slopes, incorporation of accumulated wash fines and topsoil (as applicable), installation of irrigation lines, revegetation of the channel and slopes using appropriate native species, weed control, and monitoring. Upon completion of the extraction activities, the entire site would be reclaimed in accordance with the mining and reclamation plan.

2.0 ENVIRONMENTAL SETTING

2.1 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

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 contribute to 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.

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

more conveniently 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. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA units. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 micro-Pascals (mPa).

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-dBA 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 dBA higher than one source under the same conditions.

2.2 NOISE AND VIBRATION SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, schools, transient lodging (hotels), hospitals, and educational facilities. Industrial and commercial land uses are generally not considered sensitive to noise. NSLUs in the project area include single-family residences to the north of the project site across Willow Glen Drive, adjacent to the southern boundary of the project site, near the northeast corner of the project site, and near Steele Canyon Golf Course; Hilton Head County Park located 0.1 mile north of the project site; the ADEONA Healthcare facility along Steele Canyon Road south of the project site; and Jamacha Elementary School at the intersection of Steele Canyon Road and Jamul Drive south of the project site (refer to Figure 2).

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations are considered "vibration-sensitive" (California Department of Transportation [Caltrans] 2020). The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. Land uses in the project area that are subject to annoyance from vibration include the single-family residences and the ADEONA Healthcare facility.

2.3 REGULATORY FRAMEWORK

2.3.1 County of San Diego General Plan Noise Element

The Noise Element of the County General Plan includes guidelines for noise compatibility and establishes limitations on sound levels to be received by NSLUs (Tables N-1 and N-2 from the County General Plan), as detailed below in Table 1, *County of San Diego Noise Compatibility Guidelines*, and noise standards, as detailed in Table 2, *County of San Diego General Plan Noise Standards*. New development may cause an existing NSLU to be affected by noise caused by the new development, or it may locate a NSLU in such a place that it is affected by noise.

Table 1
COUNTY OF SAN DIEGO NOISE COMPATIBILITY GUIDELINES

	Land Use Category	55*	60*	65*	70*	75*	80*
A	Residential—single family residences, mobile homes, senior housing, convalescent homes						
B	Residential—multi-family residences, mixed-use (commercial/residential)						
C	Transient lodging—motels, hotels, resorts						
D[(1)]	Schools, churches, hospitals, nursing homes, childcare facilities						
E[(1)]	Passive recreational parks, nature preserves, contemplative spaces, cemeteries						
F[(1)]	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation						
G[(1)]	Office/professional, government, medical/dental, commercial, retail, laboratories						
H[(1)]	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair						

	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table 3, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate County decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.
	UNACCEPTABLE—New construction or development shall not be undertaken.

Source: County 2011
(1) Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL.
* Exterior Noise Level (CNEL)
Note: For projects located within an Airport Influence Area of an adopted Airport Land Use Compatibility Plan (ALUCP), additional Noise Compatibility Criteria restrictions may apply as specified in the ALUCP.

Table 2
COUNTY OF SAN DIEGO GENERAL PLAN NOISE STANDARDS

1.	The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2.	The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3.	The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA L_{EQ} (one hour average).
4.	For single-family detached dwelling units, "exterior noise level" is defined as the noise level 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 net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
5.	For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas that are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6.	For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7.	For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8.	The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9.	For Categories E and F, the exterior noise level standard shall not exceed the limit defined as "Acceptable" in Table N-1 or an equivalent one-hour noise standard.

Source: County 2011
Note: Exterior Noise Level compatibility guidelines

2.3.2 County of San Diego Code of Regulatory Ordinances – Noise Ordinance

Sections 36.401 through 36.423 of the County of San Diego Code of Regulatory Ordinances discuss further County noise requirements. The purpose of the Noise Ordinance is to regulate noise in the unincorporated area of the County to promote the public health, safety, comfort, and convenience of the County's inhabitants and its visitors.

2.3.2.1 Section 36.404, General Sound Level Limits

The Noise Ordinance sets limits pertaining to the generation of exterior noise, as follows:

(a) It is 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 3, *County of San Diego Noise Ordinance Exterior Sound Level Limits*.

Table 3
COUNTY OF SAN DIEGO NOISE ORDINANCE EXTERIOR 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-87, S-90, S-92 and R-V and R-U with a density of less than 11 dwelling units per acre.	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	50 45
(2) R-RO, R-C, R-M, S-86, V5 and R-V and R-U with a density of 11 or more dwelling units per acre.	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	55 50
(3) S-94, V4 and all other commercial zones.	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 a.m.	60 55
(4) V1, V2	7:00 a.m. to 7:00 p.m.	60
V1, V2	7:00 p.m. to 10:00 p.m.	55
V1	10:00 p.m. to 7:00 a.m.	55
V2	10:00 p.m. to 7:00 a.m.	50
V3	7:00 a.m. to 10:00 p.m. 10:00 p.m. to 7:00 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) S-88 (see subsection (c) below)	-	-

Source: County of San Diego Code of Regulatory Ordinances Section 36.404.
Zoning Code Definitions: R-S = Single-Family Residential; R-D = Duplex Residential; R-R = Rural Residential; R-MH = Mobile Home Residential; A-70 = Limited Agriculture; A-72 = General Agriculture; S-80 = Open Space; S-90 = Holding Area; S-92 = General Rural; S-94 = Transportation and Utility Corridor; R-V = Variable-Family Residential; R-RO = Residential-Recreation Oriented; R-C = Residential-Commercial; R-M = Multi-Family Residential; S-86 = Parking; R-U = Urban Residential; V1, V2, V3, V4, and V5 = Village Designations; M-50 = Basic Industrial; M-52 = Limited Industrial; M-54 = General Impact Industrial; S-82 = Extractive Use; M-56 = Mixed Industrial; M-58 = High-Impact Industrial; S-88 = Specific Plan

(b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

(c) S-88 zones are Specific Planning Areas that allow for different uses. The sound level limits in Table 1 above that apply in an S-88 zone depend on the use being made of the property. The limits in Table 1-3, subsection (1) apply to property with a residential, agricultural, or civic use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M-50, M-52, or M-54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M-56 or M-58 zone.

(d) 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.

(e) 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.

(f) 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 six feet from the boundary of the easement upon which the facility is located.

2.3.2.2 Section 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:

a. Between the hours of 7:00 p.m. and 7:00 a.m.

b. On a Sunday or a holiday. For the purposes of this section a holiday means January 1, the last Monday in May, July 4, the first Monday in September, the fourth Thursday in November, and December 25. 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**.**

2.3.2.3 Section 36.409, Construction Noise

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 dB for an 8-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.

2.3.2.4 Section 36.410, Impulsive Noise

Section 36.410 provides additional limitation on construction equipment beyond Section 36.404 pertaining to impulsive noise. Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 4*, County of San Diego Maximum Sound Levels (Impulsive)*, 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.

Table 4
COUNTY OF SAN DIEGO MAXIMUM SOUND LEVELS (IMPULSIVE)

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

Source: County of San Diego Municipal Code Section 36.410
dBA = A-weighted decibel; L_{MAX} = maximum noise level

The minimum measurement period for any measurements is one hour. During the measurement period, a measurement must be conducted every minute from a fixed location on an occupied property. The measurements must 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 be deemed that the maximum sound level was exceeded during that minute.

2.4 EXISTING CONDITIONS

2.4.1 Surrounding Land Uses

Single-family residences are located to the north of the project site across Willow Glen Drive and adjacent to the southern boundary of the project site. Extractive operations are located to the northeast and an adjacent golf course is located to the southeast. Open space is present in the hills south, east, and west of the project site and includes a National Wildlife Refuge that abuts the western end of the property along the Sweetwater River, which flows in a northeast-to-southwest direction through the central portion of the project site. Jamacha Elementary School and the ADEONA Healthcare facility are located approximately 1,200 feet and 350 feet south of the project site, respectively. Hilton Head County Park, Cottonwood Park, and Steele Canyon County Park are located 0.1 mile to the north, 0.32 mile to the north, and 0.36 mile to the south of the project site, respectively (refer to Figure 2 for surrounding land uses).

2.4.2 Existing Noise Conditions

2.4.2.1 General Site Survey

A site visit was conducted on January 3, 2019, during which eight short-term ambient daytime noise measurements were taken at locations adjacent to and near the project site. The locations were chosen to be representative of the existing noise environments of general areas in proximity to the project site containing NSLUs. The measured ambient noise levels are shown in Table 5, *Ambient Noise Measurement Results*, and the approximate location for each measurement is shown on Figure 4, *Noise Measurement Locations*. Site visit field sheets are included in Appendix A, *Site Visit Noise Measurement Sheets.*

Table 5
AMBIENT NOISE MEASUREMENT RESULTS

Measurement	Location	Conditions	Time	dBA L_{EQ}	Notes
M1	Eastern side of Steele Canyon Road, between Heatherwood Drive and Par 4 Drive; approximately 30 feet from the roadway centerline	63°F, 5 mph wind, 23 percent humidity, sunny	1:52 p.m. to 2:07 p.m.	75.7	Traffic along Steele Canyon Road dominant noise source; high traffic levels, distant helicopter noise
M2	Western terminus of Par 4 Drive	63°F, 5 mph wind, 23 percent humidity, sunny	2:14 p.m. to 2:24 p.m.	52.4	Low noise levels; distant leaf blower noise; ambient nature noise
M3	Northern side of Willow Glen Drive, east of Muirfield Drive; approximately 30 feet from the roadway centerline	63°F, 5 mph wind, 23 percent humidity, sunny	2:55 p.m. to 3:10 p.m.	77.2	Traffic along Willow Glen Drive dominant noise source; high traffic levels
M4	Western boundary of project site; approximately 500 feet south of Willow Glen Drive	64°F, 5 mph wind, 23 percent humidity, sunny	3:19 p.m. to 3:29 p.m.	52.5	Low noise levels; ambient nature sounds; distant traffic noise from Willow Glen Drive
M5	In the existing parking lot of Cottonwood Golf Club; approximately 70 feet from the roadway centerline	62°F, 5 mph wind, 23 percent humidity, sunny	3:53 p.m. to 4:03 p.m.	65.3	Traffic along Willow Glen Drive dominant noise source; ambient parking lot noise from people and cars associated with Cottonwood Golf Club
M6	Northwestern side of Willow Glen Drive near eastern edge of project site boundary; approximately 25 feet from the roadway centerline	62°F, 5 mph wind, 23 percent humidity, sunny	4:17 p.m. to 4:32 p.m.	76.7	High-speed traffic along Willow Glen Drive dominant noise source
M7	Southeastern side of Wind River Road between Sonett Street and Ryan Court	60°F, 5 mph wind, 23 percent humidity, sun starting to set	4:53 p.m. to 5:03 p.m.	52.4	Low noise levels; ambient noise from neighborhood and distant traffic
M8	Southern edge of project site boundary, along Ivanhoe Ranch Road, east of Cottonwood View Drive	60°F, 5 mph wind, 23 percent humidity, sun setting	5:21 p.m. to 5:31 p.m.	55.5	Low noise levels; ambient nature sounds; low traffic levels

Cottonwood Sand Mine Project

Project Site
MUP Boundary
Proccessing Plant
Subphase Areas
Noise Measurement Location

M1
M2
M3
M4
M5
M6
M7
M8

Jamacha Way
Greenwick Rd
Greencrest Dr
Greencrest Ct
Monte View Ct
Via Hacienda
Brabham St
Woodpine Dr
Woodrun Pl
Mirage Ct
Melvyn Pl
Porterfield Pl
Targa Pl
Seca St
Sonett St
Aspen Ln
Wind River Rd
Sea Pines Rd
Congressional Dr
Sawgrass St
Augusta Ct
Hilton Head Pl
Hilton Service
Via Rancho San Diego
Jamacha Rd
Saint James Dr
Hilton Head Rd
Emerald Point Ct
Willow Glen Dr
Steele Canyon Rd
Heatherwood Dr
Par Four Dr
Ivanhoe Ranch Rd
Cottonwood Springs Ln
Indian Mills Ln
Jamul Dr
Greystone Dr
Wentworth Wy
Wentworth Dr
Ashley Park Dr
Stonefield Dr

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0 700 Feet

Source: Aerial (SanGIS, 2017)

HELIX Environmental Planning

Noise Measurement Locations

Figure 4

3.0 ANALYSIS METHODOLOGY AND ASSUMPTIONS

3.1 METHODOLOGY AND EQUIPMENT

The following equipment was used to measure existing noise levels at the project site:

- Larson Davis System LxT Integrating Sound Level Meters
- Larson Davis Model CAL250 Calibrator
- Windscreen and tripod for the sound level meter

The sound-level meters were field-calibrated immediately prior to the noise measurement to ensure accuracy. All measurements were made with meters that conform to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers' standards.

Modeling of the exterior noise environment for this report was accomplished using Computer Aided Noise Abatement (CadnaA) version 2019. CadnaA is a model-based computer program developed by *DataKustik* for predicting noise impacts in a wide variety of conditions. CadnaA assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project-related information, such as noise source data, barriers, structures, and topography to create a detailed CadnaA model, and uses the most up-to-date calculation standards to predict outdoor noise impacts. CadnaA traffic noise prediction is based on the data and methodology used in the Traffic Noise Model (TNM) version 2.5. The TNM was released in February 2004 by the U.S. Department of Transportation (USDOT) and calculates the daytime average hourly L_{EQ} from three-dimensional model inputs and traffic data.

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which incorporates estimates of sound levels from standard construction equipment based on manufacturers' specifications and measured reference noise levels.

3.2 ASSUMPTIONS

3.2.1 Construction Activities

Prior to the commencement of mining operations, the project would require construction of site access roads and improvements on the south side of Willow Glen Drive, grading of the processing plant pad, and installation of screening berms, the conveyor belt, and the processing plant equipment. The most prominent noise-generating equipment for construction of the access roads would be a dozer, loader, and dump truck. These three pieces of equipment are conservatively assumed to operate simultaneously at a given location. The most prominent noise-generating equipment for construction of the Willow Glen Drive improvements would be the simultaneous use a dozer, dump truck, and water truck and the individual use of a saw cutter. A grader would be used for grading of the processing plant pad. Compared to construction of the site access roads, construction of the Willow Glen Drive improvements, and grading of the processing plant pad, the installation of the screening berms, conveyor belt, and processing plant equipment, which may require a crane and/or other small pieces of off-road equipment, would not generate substantial noise levels; therefore, noise associated with these

activities are not further analyzed. No impulsive noise, such as that from an impact hammer or blasting, is anticipated for the project.

Construction of the primary access road and construction grading would occur at the processing plant area to create the primary access road and a level pad for the processing machinery. Equipment operating for these activities would be mobile across the work area and is assumed to occur at an average distance of 250 feet from the project site property line and 500 feet from the nearest off-site occupied property over the course of an 8-hour workday. Equipment operating for construction of the western access road would also be mobile across the work area and is assumed to occur at an average distance of 100 feet from the project site property line and 220 feet from the nearest off-site occupied property over the course of an 8-hour workday. These distances are based on the estimated center point of the respective construction area footprints where mobile equipment would be operating over an 8-hour workday. Because construction of the Willow Glen Drive improvements would occur in a mobile and linear manner parallel to the property line on the opposite side of the roadway, construction equipment is assessed as occurring in a single location along the linear work area for a portion (assumed to be two hours) of an eight-hour workday before moving to another location along the construction alignment.

Demolition activities would be required at the existing clubhouse in the northern portion of the site, at the maintenance building in the central portion of the site, and at the restroom in the western portion of the site. Demolition is assumed to require an excavator and a concrete saw; however, these pieces of equipment would not be used simultaneously. Demolition would occur 250 feet from the project site property line and 450 feet from the nearest off-site occupied property.

3.2.1.1 Construction Equipment Noise Levels

Table 6, *Construction Equipment Noise Data*, presents the calculated sound power levels (S_{WL}) for typical construction equipment that would be used for the project. This table includes data from the site measurements, the Federal Highway Administration (FHWA) table of construction equipment noise levels (FHWA 2017), and the United Kingdom's Department for Environment, Food and Rural Affairs (Defra) construction noise database (Defra 2005). S_{WL} measures the total acoustic power radiated from a given sound source; it does not incorporate a distance component.

Table 6
CONSTRUCTION EQUIPMENT NOISE DATA[1]

Source	31.5*	63*	125*	250*	500*	1,000*	2,000*	4,000*	8,000*	Overall A-weighted Value (dBA)
Excavator	121.0	126.0	119.0	118.0	118.0	114.0	112.0	109.0	104.0	120.0
Loader	124.7	121.7	117.7	111.7	112.7	109.7	106.7	106.7	95.7	115.4
Dozer	-	125.5	114.5	116.5	113.5	112.5	118.5	102.5	96.5	121.2
Dump Truck	31.0	116.0	118.0	108.0	106.0	107.0	104.0	100.0	93.0	111.5
Grader	-	88.0	87.0	83.0	79.0	84.0	78.0	74.0	65.0	86.0
Concrete Saw	-	106.7	123.7	115.7	114.7	114.7	116.7	120.7	119.7	125.3

Source: FHWA 2017, Defra 2005, and on-site measurements.
[1] All source data for equipment noise presented as sound power level (S_{WL}).
* One-octave Center Band Frequency (Hertz)

3.2.1.2 Construction Traffic

The project's relatively minor construction activities would involve only a few pieces of equipment operating over the course of a workday and therefore would not require a high number of workers or generate a high number of worker commute trips to and from the project site. Similarly, because project construction would not involve substantial import or export of materials, the number of haul truck trips on a given construction day are anticipated to be minimal. As such, noise level increases associated with construction-generated traffic are not further analyzed.

3.2.2 Project Operations

Project operations would involve excavation area grading (including vegetation clearing, topsoil removal, and stockpile creation), material extraction, and reclamation for each individual sub-phase, as described in Section 1.2. Material processing would occur at a constant location at the processing plant for the duration of project operations. Anticipated noise sources for each of these operational activities are described in the following sections. Excavation area grading, material extraction, and reclamation would occur sequentially for each sub-phase, and noise sources from each activity would not occur at the same time and location; however, because these activities may occur in proximity to one another when in adjacent sub-phase areas, grading activities and material extraction activities are analyzed as occurring simultaneously and thereby generating combined noise at nearby receptors. The two activities are conservatively assumed to be located approximately 200 feet from each other. Because equipment used for reclamation would generally be limited to a skid steer loader, which is a relatively small piece of equipment that does not generate substantial noise (approximately 65 dBA at 100 feet), noise levels from reclamation activities would be minimal and impacts associated with reclamation are not further analyzed.

3.2.2.1 Excavation Area Grading

Prior to material extraction within a given sub-phase excavation area, grading would occur to prepare the area for extraction activities and would include vegetation clearing, topsoil removal, and stockpile creation. The loudest piece of equipment used for this activity would be a dozer. Noise data for a dozer are included above in Table 6. Excavation area grading would occur between the hours of 7:00 a.m. and 5:00 p.m. on weekdays.

3.2.2.2 Material Extraction

Off-road Equipment

Raw materials would be excavated throughout the site using a total of two front-end loaders and a tracked excavator, which would then load material onto the conveyor belt for transport to the processing area. A dump truck was included in the modeling to provide a conservative analysis in case additional material transport to the start of the conveyor belt is required. It is assumed that the loaders and excavator would not be used at the same time and location due to space and safety constraints (i.e., either one loader and a dump truck or one excavator and a dump truck would be used at a given time and location). Because an excavator generates a higher noise level than a loader, the combination of an excavator and dump truck is analyzed herein for material extraction activities. The raw material excavation process would occur between the hours of 7:00 a.m. and 5:00 p.m. on weekdays. The

calculated S_{WL} for off-road equipment that would be used for excavation of raw material are presented in Table 7, *Excavation Equipment Noise Data*.

Table 7
EXCAVATION EQUIPMENT NOISE DATA[1]

Source	31.5*	63*	125*	250*	500*	1,000*	2,000*	4,000*	8,000*	Overall A-weighted Value (dBA)
Excavator	121.0	126.0	119.0	118.0	118.0	114.0	112.0	109.0	104.0	120.0
Loader	124.7	121.7	117.7	111.7	112.7	109.7	106.7	106.7	95.7	115.4
Dump Truck	31.0	116.0	118.0	108.0	106.0	107.0	104.0	100.0	93.0	111.5

Source: FHWA 2017, Defra 2005, and on-site measurements.
[1] All source data for equipment noise presented as sound power level (S_{WL}).
* One-octave Center Band Frequency (Hertz)

Conveyor Belt

A conveyor belt would be used to transport mined raw material from the excavation area to the processing plant area. In Phase 1, the conveyor line would initially run parallel to Willow Glen Drive and cross beneath Steele Canyon Road near the northern edge of the bridge that crosses Sweetwater River. The conveyor line would be relocated eastward in Phase 2 and, subsequently, further eastward in Phase 3 as mining operations proceed into these phases. The conveyor belt would generate a low rumbling noise as it transports mined material. Modeled noise levels associated with operation of the conveyor belt are based on measurements conducted by HELIX at a similar facility on January 28, 2020. A noise level of 54.7 dBA at 50 feet is used for modeling the conveyor belt as a line source.

3.2.2.3 Processing Plant Operations

Screening Machine

A screening machine would be used to separate granulated ore material into multiple grades by particle size. The screening machine would consist of a wet blade mill fed by the incoming materials belt to break up material clumps, a drive to induce vibration, a wet screen media to induce particle separation, and a deck to hold the screen media and drive. The screen would feed into a wet screw to finish washing and remove fine materials. The processing plant would operate between the hours of 7:00 a.m. and 5:00 p.m. on weekdays. Table 8, *Screening Machine Noise Levels*, presents the calculated S_{WL} for a screening machine that would be used for the project.

Table 8
SCREENING MACHINE NOISE LEVELS[1]

Equipment	31.5*	63*	125*	250*	500*	1,000*	2,000*	4,000*	8,000*	Noise Sum (dBA)
Screening Machine	106.7	100.5	104.3	105.3	105.5	101.5	100.3	98.5	97.8	108.0

[1] Given as sound power level (S_{WL}) unless otherwise noted.
Note: Noise data based on measurements of similar equipment conducted by HELIX on October 11, 2011 at the Superior Ready Mix Lakeside Facility.
* Octave Band Center Frequency (Hertz)
dBA = A-weighted decibel

On-site Haul Truck Loading Activities

Upon completion of processing, the construction grade aggregate would be loaded onto haul trucks for transport off site for market use. A total of 88 haul trucks would be used per day, with a maximum of 18 trucks used per hour. Haul trucks would arrive at the site's processing plant area via Willow Glen Drive, turn off onto a looped on-site driveway, be loaded with aggregate product by a loader, and depart the site back onto Willow Glen Drive. On-site haul truck loading activities would occur from 9:00 a.m. to 3:30 pm Monday through Friday.

3.2.2.4 Mine Operation Traffic

As discussed above, mining operations would involve 88 haul trucks per day, which result in 176 daily haul truck trips. On-road haul truck activities would occur from 9:00 a.m. to 3:30 p.m. Monday through Friday. Mining operations would also generate 28 daily employee vehicle trips and 8 daily vendor vehicle trips (Linscott, Law & Greenspan, Engineers [LLG] 2021). Haul trucks, employees, and vendors would access the project site via the proposed driveway along Willow Glen Drive, east of Steele Canyon Drive. No project-generated traffic is anticipated to travel east of the project driveway along Willow Glen Drive. For the purpose of this analysis, it was conservatively assumed that 18 haul trucks would arrive at and depart from the project site along Willow Glen Drive during a peak hour.

3.2.2.5 Reclamation

Reclamation of the project site would involve backfilling and grading activities. Equipment used for reclamation activities would include a skid steer loader. The skid steer loader would operate at variable locations throughout the site.

4.0 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

The following thresholds are based on the County of San Diego Guidelines for Determining Significance – Noise (County 2009a) and the County of San Diego Report Format and Content Requirements – Noise (County 2009b), as applicable to the project

4.1 MINING OPERATION NOISE

Impacts would be significant if the project's mining operations would:

1. Result in the exposure of any on- or off-site, existing, or reasonably foreseeable future NSLU to exterior or interior noise (including noise generated by the project, together with noise from roads, railroads, airports, heliports, and all other noise sources) in excess of any of the following:
    a. Exterior[1] Locations:
        i. 60 dB CNEL; or
        ii. An increase of 10 dB CNEL over pre-existing noise in areas where ambient noise levels are 49 dB CNEL are less.
    b. Interior Locations:
        i. 45 dB CNEL.
2. Result in one-hour average noise levels in excess of 75 dBA at the property line of the project site, per the County of San Diego Noise Ordinance (refer to Section 36.404e).

A 45 dB CNEL interior limit would be achieved if exterior locations achieve a 60 dB CNEL or less noise level, based on a typical attenuation of 15 dB by standard residential building construction. As such, the following analysis relies on the 60 dB CNEL exterior noise limit as the applicable threshold and does not analyze interior noise levels separately.

4.2 CONSTRUCTION NOISE

A temporary or periodic increase in ambient noise levels due to construction would be considered significant if noise from non-emergency construction activity exceeds 75 dBA for an eight-hour period between 7:00 a.m. and 7:00 p.m.; if impulsive noise exceeds 82 dBA L_{MAX} at an occupied residential use or 85 dBA L_{MAX} at an occupied agricultural, commercial, or industrial use; or if noise is generated between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, or any time on Sundays or holidays.

4.3 COMBINED AND CUMULATIVE NOISE IMPACTS

A direct noise impact would occur if the project, combined with existing ambient noise levels, would double the noise levels (an increase of 3 dBA CNEL or greater) for locations where exterior noise levels exceed the standards of the County Noise Element.

[1] Exterior noise shall be measured at all exterior areas provided for group or private usable open space (County 2009a).

A cumulative impact would occur if a project would contribute to a cumulative scenario that would result in the exposure of any on- or off-site, existing, or reasonably foreseeable future NSLU, to:

- An increase of 10 dBA (CNEL) over pre-existing noise levels resulting in a combined exterior noise level of 60 dBA CNEL or greater; or

- An increase of 3 dBA CNEL in Existing + Project + Cumulative conditions if that total is above 60 dBA CNEL.

A "cumulatively considerable" project contribution to an identified significant cumulative noise impact would occur if the project contributes more than a 1 dBA increase to the cumulative noise level.

4.4 VIBRATION

Impacts associated with ground-borne vibration and noise would be significant if project implementation would expose the uses listed in Table 4, *Guidelines for Determining the Significance of Ground-borne Vibration and Noise Impacts*, and Table 5, *Guidelines for Determining the Significance of Ground-borne Vibration and Noise Impacts for Special Buildings*, of the County Noise Guidelines (County 2009a) to ground-borne vibration or noise levels equal to or in excess of the levels. Note that the County guidelines for ground-borne vibration impacts state that "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." Caltrans updated its *Transportation and Construction Vibration Guidance Manual* in April 2020 and vibration threshold values included in the report are used herein to determine vibration impact significance. Impacts would be significant if construction or operation of the project would result in the exposure of persons to ground-borne vibration equal to or in excess of Caltrans' (2020) distinctly perceptible human response threshold of 0.035 inch per second (in/sec) peak particle velocity (PPV for steady state sources or 0.24 in/sec PPV for transient sources), per Table 9, *Caltrans Guideline Vibration Annoyance Potential Criteria*, below.

Table 9
CALTRANS GUIDELINE VIBRATION ANNOYANCE POTENTIAL CRITERIA

Human Response	Maximum PPV (in/sec) Transient Sources	Maximum PPV (in/sec) Steady State Sources
Barely perceptible	0.035	0.012
Distinctly perceptible	0.24	0.035
Strongly perceptible	0.9	0.1

Source: Caltrans 2020
PPV = peak particle velocity; in/sec = inches per second

5.0 IMPACTS

5.1 MINING OPERATION NOISE

The project would generate elevated noise levels during operation of its individual components that would have the potential to affect nearby NSLUs. As described in Section 3.2.2, prominent operational noise sources would include grading activities, including topsoil removal and vegetation clearing (dozer);

processing plant activities (on-site haul truck loading and stationary plant machinery); raw material extraction (off-road equipment and conveyor belt); and on-road haul truck activities (a maximum of 18 trucks per hour traveling west of the project driveway along Willow Glen Drive). Processing plant activities would be in a constant location over the 10-year mining period. Grading and material extraction would occur sequentially for each sub-phase, and noise sources from each activity would not occur at the same time and location; however, because these activities may occur in proximity to one another when in adjacent sub-phase areas, grading activities and material excavation activities are analyzed as occurring simultaneously and thereby generating combined noise at nearby receptors. It is important to note that because of the project's proposed phased approach to mining operations, individual receivers surrounding the project site would not be exposed to noise from the project's most substantial noise generating activities (grading and material extraction) for the entire 10-year project period. While the processing plant would be stationary, noise levels from operation of the processing plant would be below the applicable thresholds of 60 dB CNEL at nearby NSLUs and 75 dBA L_{EQ} at the project site property line, as shown in the following section.

The project's mining operations would also generate elevated noise levels at adjacent land that contains potentially suitable habitat for nesting bird species. Noise effects would be considered potentially significant if noise levels generated during the project's operations exceed a level of 60 dBA L_{EQ} or ambient (whichever is greater) adjacent to sensitive nesting bird species such as California gnatcatcher, least Bell's vireo, and raptors. Potential noise-related impacts to nesting bird species are addressed in the project's Biological Resources Technical Report (HELIX 2021).

5.1.1 Impact Analysis

5.1.1.1 Exterior Use Area Noise Threshold

Potential NSLUs immediately surrounding the project site that would be subject to noise from mine operations include single-family residences, Hilton Head County Park, and the ADEONA Healthcare facility. Due to the large number of residential properties adjacent to the project site, surrounding residences were grouped by general location and anticipated proximity to processing plant, grading, material extraction, and on-road haul truck activities for this analysis. Noise levels at one modeled receiver location in each of the 11 residential groups were estimated to be representative of the maximum noise levels that would be experienced by residences in that group. Figure 5, *Receivers and Residential Groups,* shows the residential groups and the representative receivers in each group. Generally, receivers chosen to be representative of each group were those closest to both the processing plant and excavation areas, and thus exposed to the highest noise levels. In addition to the 11 residential groups, noise levels were also analyzed at Hilton Head County Park, the ADEONA Healthcare facility, and four isolated single-family residences.

Table 10, *Mining Operation Noise Levels*, presents the estimated maximum noise levels at the exterior use areas of the 14 receivers from processing plant, grading, material extraction, and on-road hauling activities. As shown in Table 10, combined noise levels at modeled receiver locations within residential groups 1 through 5, 8, 10, and 11, as well as Isolated Residence 2, Isolated Residence 3, and the ADEONA Healthcare facility would exceed the applicable 60 dB CNEL noise threshold and impacts to receivers in these areas would be potentially significant.

Cottonwood Sand Mine Project

- Project Site
- San Diego Gas & Electric Easement
- MUP Boundary
- Processing Area
- Subphase Areas
- Residential Group
- Property Line Receiver
- Off-site Receiver
- Modeled Excavation Area

Jamacha Way
Elva St
Capri Ct
Darlington Ct
Targa Pl
Sonett St
Porterfield Pl
Seca St
Greenwick Rd
Greencrest Dr
Greencrest Ct
Mirage Ct
Merlyn Pl
Aspen Ln
Wind River Rd
Brabham St
Via Hacienda
Woodpine Dr
Woodrun Pl
Sea Pines Rd
Via Rancho San Diego
Hilton Head Pl
Sawgrass St
Congressional Dr
Hilton Service
Jamacha Rd
Augusta Ct
Hilton Head County Park
Hilton Head Rd
Port of Saint James Dr
Emerald Point Ct
Willow Glen Dr
Steele Canyon Rd
Heatherwood Dr
Par Four Dr
Adeona Healthcare Facility
Jamul Dr
Greystone Dr
Cottonwood Springs Ln
Indian Mills Ln
Wentworth Way
Wentworth Dr
Ashley Park Dr
Stonefield Dr
Ivanhoe Ranch Rd

1 2 3 4 5 6 7 8 9 10 11

Isolated Residence 1
Isolated Residence 2
Isolated Residence 3
Isolated Residence 4
Steele Canyon Golf Course

0 700 Feet

Source: Aerial (SanGIS, 2017)

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HELIX Environmental Planning

Receivers and Residential Groups

Figure 5

Table 10
MINING OPERATION NOISE LEVELS

Receiver Area	Maximum Noise from Processing Plant (dBA/CNEL)	Maximum Noise from Material Extraction and Grading (dBA/CNEL)	Maximum Noise from On-road Haul Trucks (dBA/CNEL)	Maximum Combined Noise (dBA/CNEL)	Exceed 60 dB CNEL Limit?
Residential Group 1	35.2/29.9	69.6/65.8	56.5/50.8	69.8/**65.9**	**Yes**
Residential Group 2	39.0/33.7	68.7/64.9	58.5/52.8	69.1/**65.2**	**Yes**
Residential Group 3	40.0/34.7	68.5/64.7	58.3/52.6	68.9/**65.0**	**Yes**
Residential Group 4	45.8/41.1	68.1/64.3	58.5/52.8	68.6/**64.6**	**Yes**
Residential Group 5	49.9/44.8	67.0/63.2	54.1/48.4	67.3/**63.4**	**Yes**
Residential Group 6	46.3/40.9	46.5/42.7	35.8/30.1	49.6/45.0	No
Residential Group 7	49.6/44.3	52.5/48.7	37.9/32.2	54.4/50.1	No
Residential Group 8	44.2/38.9	66.1/62.3	26.6/20.9	66.1/**62.3**	**Yes**
Residential Group 9	50.6/45.2	53.1/49.3	36.3/30.6	55.1/50.8	No
Residential Group 10	48.7/43.9	70.3/66.5	38.6/32.9	70.3/**66.5**	**Yes**
Residential Group 11	38.5/33.2	73.7/69.9	42.9/37.2	73.7/**69.9**	**Yes**
Isolated Residence 1	58.2/52.8	61.0/57.2	45.9/40.2	62.9/58.6	No
Isolated Residence 2	37.1/31.9	64.9/61.1	30.5/34.8	64.9/**61.1**	**Yes**
Isolated Residence 3	37.2/32.0	66.1/62.3	34.4/28.7	66.1/**62.3**	**Yes**
Isolated Residence 4	42.4/37.2	58.0/54.2	40.0/34.3	58.2/54.3	No
Hilton Head County Park	36.0/30.8	55.6/51.8	40.9/35.2	55.8/51.9	No
ADEONA Healthcare	45.5/40.4	64.5/60.7	38.8/33.1	64.6/**60.7**	**Yes**

CNEL = Community Noise Equivalent Level; dBA = A-weighted decibel

Generally, the receiver locations that exceed the 60 dB CNEL limit are located near project site areas where material extraction would occur. For the purpose of conservative analysis, extraction activities were modeled adjacent to receivers. Actual extraction activities during mining operations would not occur within these areas for the entire duration of the active mining phase. In addition, extraction activities were modeled to occur at-grade, while during actual mining operations a substantial amount of extraction would occur below-grade, thus providing noise attenuation between the equipment and off-site NSLUs. It can therefore be reasonably assumed that noise levels at a given receiver would not exceed the 60 dB CNEL threshold for the entire phase duration. However, because 11 of the receiver locations exceed the applicable 60 dB CNEL limit, **noise impacts from mining activities to exterior use areas at NSLUs are assessed as potentially significant (Impact N-1).** The project would implement mitigation measure NOI-1 to reduce noise levels from mining activities at occupied properties near the project site.

5.1.1.2 Property Line Noise Threshold

Noise levels at the project site property line were calculated at two locations in the processing plant area adjacent to noise sources (refer to Figure 5). Due to the proximity of the noise sources, these two property line locations are anticipated to be subject to the highest property line noise levels of the project site. One modeled location is at the property line adjacent to the screen plant and the other modeled location is at the property line adjacent to the haul truck loading area. The calculated noise level at the location adjacent to the screen plant is 74.7 dBA and the calculated noise level at the

location adjacent to the haul truck loading area is 71.4 dBA. Both are below the 75-dBA threshold. Because these two locations are below the 75-dBA threshold, it is anticipated that noise levels along the entire project site property line would be below the 75-dBA threshold and would therefore be in compliance with the County Noise Ordinance for extractive industries. In addition, as shown in Table 10, noise levels at the receivers at residential groups 10 and 11, which are along the property line in proximity to mining excavation areas, would not exceed 75 dBA. Therefore, noise impacts at on-site property lines from the operation of the Project would be less than significant**.**

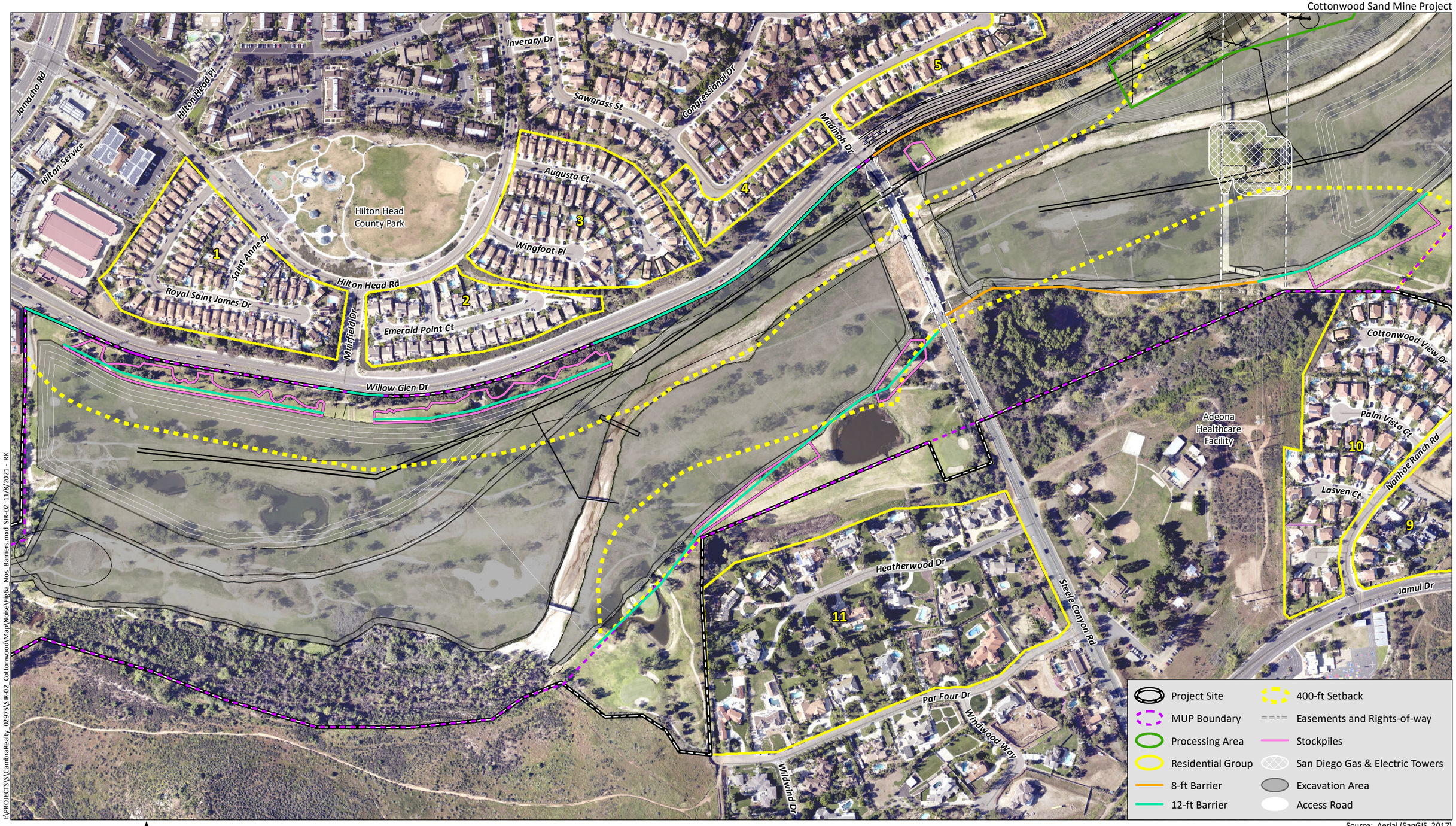
5.1.2 Mitigation Measures

To decrease noise levels from mining operations at occupied properties surrounding the project site, the following mitigation measure shall be implemented. The noise barrier requirements included in the following measure were determined through CadnaA modeling, which takes into account the topography of the project site and surrounding areas.

NOI-1 Below-Grade Excavation and Noise Barriers: Raw material extraction equipment operating within 400 feet of off-site NSLU useable space areas shall be located at the lowest feasible elevation within the project's excavation areas such that the topography shall provide noise attenuation to off-site properties. To achieve the lowest feasible elevation, initial at-grade excavation activities shall be performed at least 400 feet from off-site NSLU useable space areas, as indicated in Figures 6a-c, *Noise Barriers*. Following this initial excavation to the lowest feasible elevation, excavation can extend outward and toward the NSLUs while maintaining the lowest feasible elevation at the active working face where extraction equipment is operating.

For NSLUs located at residential groups 5 and 8 (as shown on Figure 5), as well as Isolated Residence 2, Isolated Residence 3, and the ADEONA Healthcare facility, an 8-foot-high noise barrier, constructed to the specifications identified below, shall be provided between excavation activities and the off-site NSLUs, when excavation is occurring within 400 feet of each location. When mining activities are occurring at distances greater than 400 feet from a given receiver location, a barrier would not be required adjacent to that receiver location. The barriers shall be located as shown on Figure 6a-c and break the line of sight between the excavation activities and receivers. For the barriers adjacent to residential groups 5 and 8, the required barrier height (8 feet) shall be measured relative to the adjacent project site property line elevation. If the barrier is constructed at a location with an elevation lower than that of the adjacent project site property line, the total barrier height would be greater than the required barrier height in order to provide adequate noise attenuation (e.g., if the barrier with a required height of 8 feet is to be located at a surface elevation 5 feet below the adjacent project site property line elevation, the total barrier height would be 13 feet).

For NSLUs located at residential groups 1, 2, 3, 4, 10, and 11 (as shown on Figure 5), a 12-foot-high noise barrier, constructed to the specifications identified below, shall be provided between excavation activities and the off-site NSLUs, when excavation is occurring within 400 feet of each location. When mining activities are occurring at distances greater than 400 feet from a given receiver location, a barrier would not be required adjacent to that receiver location. The barriers shall be located as shown on Figure 6a-c and break the line of sight between the excavation activities and receivers. For the barriers adjacent to residential groups 1, 2, 3, and 4, the required barrier height (12 feet) shall be measured relative to the adjacent project site property line elevation. If the barrier is constructed at a location with an elevation lower than



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0 350 Feet

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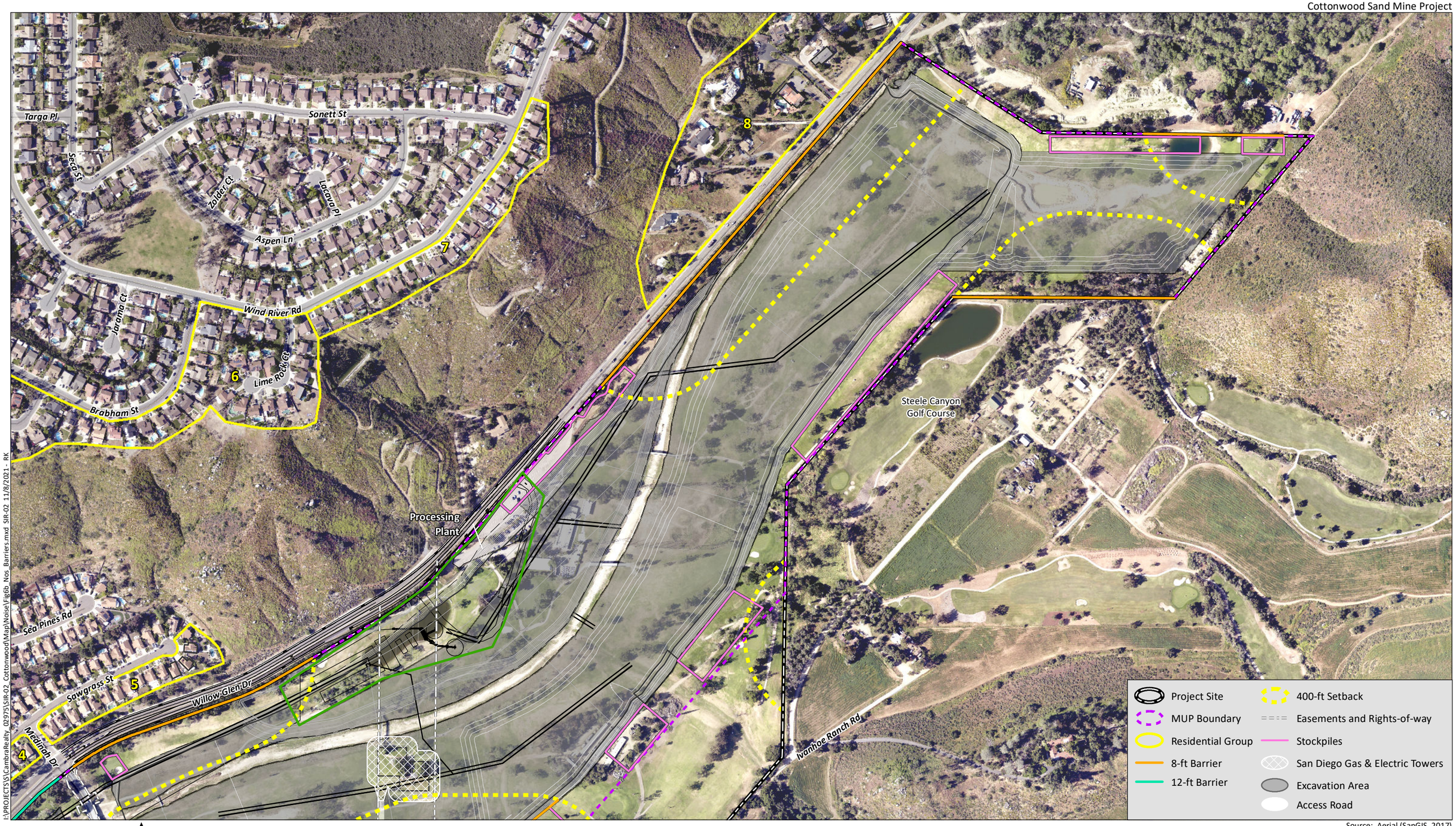
Source: Aerial (SanGIS, 2017)

HELIX Environmental Planning

Noise Barriers

Figure 6a

Cottonwood Sand Mine Project



Source: Aerial (SanGIS, 2017)

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HELIX Environmental Planning

Noise Barriers

Figure 6b

Cottonwood Sand Mine Project

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0 350 Feet

Source: Aerial (SanGIS, 2017)

HELIX Environmental Planning

Noise Barriers

Figure 6c

that of the adjacent project site property line, the total barrier height would be greater than the required barrier height in order to provide adequate noise attenuation (e.g., if the barrier with a required height of 12 feet is to be located at a surface elevation 5 feet below the adjacent project site property line elevation, the total barrier height would be 17 feet).

The noise barriers must be solid. They can be constructed of soil (in the form of a berm or stockpile), masonry, wood, plastic, fiberglass, steel, or a combination of those materials, as long as there are no cracks or gaps, through or below the walls. Any seams or cracks must be filled or caulked. If wood is used, it can be tongue and groove and must be at least one-inch total thickness or have a density of at least 3.5 pounds per square foot. 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 wood with a thickness of at least one inch, solid-sheet metal of at least 18-gauge metal, or an exterior-grade solid-core steel door with prefabricated doorjambs. Stockpiles must be continuous and maintain the required height along their entire length.

5.1.3 Significance After Mitigation

Table 11, *Mitigated (8-foot Barrier) Mining Operation Noise Levels*, presents the estimated maximum noise levels at the receivers from processing plant, grading, material extraction, and on-road haul truck activities with implementation of an 8-foot-high noise barrier at all receiver locations except for residential groups 6, 7, and 9, the Isolated Residences 1 and 4, and Hilton Head County Park, which do not require barrier mitigation. In addition to the construction of the sound barriers, mitigation measure NOI-1 requires all raw material excavation equipment operating within 400 feet of off-site NSLU useable space areas to be located at the lowest feasible elevation within the project's excavation areas to provide noise attenuation to off-site properties. This allows the topography to block noise from extraction activities occurring below grade at the active working face. Given the potential for groundwater throughout the project site, excavation depths would average 20 feet bgs, with some areas outside the existing low-flow channel excavated to a maximum depth of 40 feet bgs. Areas identified for mining up to 40 feet bgs, as applicable based on the water table, are those that have not been previously disturbed by golf course development or previous excavation activities within sub-phases 1-B, 1-C, 2-B, 2-C, and the eastern portion of sub-phase 3-A. To achieve the lowest feasible elevation, initial at-grade excavation activities would be performed at least 400 feet from off-site NSLU property lines. Once at the lowest feasible elevation at the initial excavation locations, material excavation would extend outward and toward the NSLUs while maintaining this lowest feasible elevation. The below grade excavation in combination with noise barriers would effectively break the line of sight between the mining equipment and NSLUs, thus attenuating noise levels. As shown in Table 11, noise levels at all modeled receiver locations except residential groups 1, 2, 3, 4, 10, and 11 would be reduced to the 60 dB CNEL threshold or below and impacts at these locations would be less than significant.

Table 11
MITIGATED (8-FOOT BARRIER) MINING OPERATION NOISE LEVELS

Receiver Area	Maximum Noise from Processing Plant (dBA/CNEL)	Maximum Noise from Material Extraction and Grading (dBA/CNEL)	Maximum Noise from On-road Haul Trucks (dBA/CNEL)	Maximum Combined Noise (dBA/CNEL)	Exceed 60 dB CNEL Limit?
Residential Group 1	35.2/29.9	63.9/60.1	56.5/50.8	64.6/**60.6**	**Yes**
Residential Group 2	38.9/33.6	63.4/59.6	58.5/52.8	64.6/**60.4**	**Yes**
Residential Group 3	39.6/34.4	65.6/61.8	58.3/52.6	66.4/**62.3**	**Yes**
Residential Group 4	43.5/38.3	63.5/59.7	58.5/52.8	64.7/**60.5**	**Yes**
Residential Group 5	49.8/44.7	62.2/58.4	54.1/48.4	63.0/59.0	No
Residential Group 8	44.1/38.7	62.4/58.6	26.6/20.9	62.5/58.6	No
Residential Group 10	45.9/40.8	64.1/60.3	39.7/34.0	64.2/**60.4**	**Yes**
Residential Group 11	36.8/31.7	67.9/64.1	42.9/37.2	67.9/**64.1**	**Yes**
Isolated Residence 2	33.1/27.9	54.0/50.2	30.5/24.8	54.1/50.2	No
Isolated Residence 3	37.1/31.9	61.4/57.6	34.4/28.7	61.4/57.6	No
ADEONA Healthcare	43.1/38.0	57.2/53.4	38.8/33.1	57.4/53.6	No

CNEL = Community Noise Equivalent Level; dBA = A-weighted decibel

Table 12, *Mitigated (12-foot Barrier) Mining Operation Noise Levels*, presents the estimated maximum noise levels at receivers within residential groups 1, 2, 3, 4, 10, and 11 from processing plant, grading, material extraction, and on-road haul truck activities with excavation occurring at the lowest feasible elevation and implementation of a 12-foot noise barrier, as required under mitigation measure NOI-1. As shown in Table 12, noise levels at these modeled receiver locations would be reduced to the 60-dB CNEL threshold or below, and impacts would be less than significant. It is worth noting that due to the varying potential excavation depths across the site (average of 20 feet bgs with a maximum depth of 40 feet bgs, as mentioned above), the noise modeling conducted for the project conservatively assumed a 10-foot excavation depth. Actual noise levels would likely be less than those presented in Tables 11 and 12 due to the increased noise attenuation achieved by the greater excavation depths than what was included in the model.

Table 12
MITIGATED (12-FOOT BARRIER) MINING OPERATION NOISE LEVELS

Receiver Area	Maximum Noise from Processing Plant (dBA/CNEL)	Maximum Noise from Material Extraction and Grading (dBA/CNEL)	Maximum Noise from On-road Haul Trucks (dBA/CNEL)	Maximum Combined Noise (dBA/CNEL)	Exceed 60 dB CNEL Limit?
Residential Group 1	35.2/29.9	59.8/56.0	56.5/50.8	61.5/57.2	No
Residential Group 2	38.8/33.6	60.2/56.4	58.5/52.8	62.5/58.0	No
Residential Group 3	39.6/34.3	63.2/59.4	58.3/52.6	64.4/60.0	No
Residential Group 4	43.5/38.3	60.6/56.8	58.5/52.8	62.7/58.3	No
Residential Group 10	44.1/39.2	60.5/56.7	36.7/31.0	60.6/56.8	No
Residential Group 11	36.6/31.5	64.3/60.0	42.9/37.2	64.3/60.0	No

CNEL = Community Noise Equivalent Level; dBA = A-weighted decibel

5.2 CONSTRUCTION NOISE

Construction of the project's site access roads, improvements on the south side of Willow Glen Drive, and processing plant, as well as associated installation of screening berms, the conveyor belt, and processing plant equipment prior to the commencement of mining operations would result in temporary increases in ambient noise levels. These construction activities would involve the use of heavy equipment. Construction noise from each construction activity is described below. Refer to Section 3.2.1 for construction equipment details and assumptions. For modeling results, refer to Appendix B, *Construction Noise Model Outputs*.

The loudest noise during construction of the primary site access road would occur from the simultaneous use of a dozer, loader, and dump truck. This would occur within the processing plant area, at an assumed average distance of 250 feet from the project site property line and 500 feet from the nearest off-site occupied property over the course of an 8-hour workday. At 250 feet a dozer, loader, and dump truck would generate a noise level of 66.4 dBA L_{EQ} (8-hour), and at 500 feet a dozer, loader, and dump truck would generate a noise level of 60.4 dBA L_{EQ} (8-hour). The loudest noise during construction of the western site access road would also occur from the simultaneous use of a dozer, loader, and dump truck. This would occur at an assumed average distance of 100 feet from the project site property line and 220 feet from the nearest off-site occupied property over the course of an 8-hour workday. At 100 feet a dozer, loader, and dump truck would generate a noise level of 74.4 dBA L_{EQ} (8-hour), and at 220 feet a dozer, loader, and dump truck would generate a noise level of 67.5 dBA L_{EQ} (8-hour). Noise from the access road construction would be less than the 75-dBA L_{EQ} (8-hour) limit and impacts would be less than significant.

The loudest noise during construction grading of the processing plant pad would occur from the use of a grader. This would occur at the processing plant area, at an assumed average distance of 250 feet from the project site property line and 500 feet from the nearest off-site occupied property over the course of an 8-hour workday. At 250 feet a grader would generate a noise level of 67.0 dBA L_{EQ} (8-hour), and at 500 feet a grader would generate a noise level of 61.0 dBA L_{EQ} (8-hour). Noise from construction grading of the processing plant pad would be less than the 75-dBA L_{EQ} (8-hour) limit and impacts would be less than significant.

The loudest noise during construction of the Willow Glen Drive improvements is anticipated to occur from the simultaneous use a dozer, dump truck, and water truck and the individual use of a saw cutter. The use of this equipment would occur 50 feet from the property line on the opposite side of the roadway and 170 feet from the nearest off-site occupied property usable area, as measured from the portion of the improvement area closest to the off-site occupied property. For work at this location for a duration of two hours (before moving to another location along the linear construction work area), the simultaneous use of a dozer, dump truck, and water truck would generate a noise level of 73.8 dBA L_{EQ} (8-hour) at 50 feet and 63.2 dBA L_{EQ} (8-hour) at 170 feet, both of which are below the 75-dBA L_{EQ} (8-hour) limit. A saw cutter would generate a noise level of 76.6 dBA L_{EQ} (8-hour) at 50 feet and 66.0 dBA L_{EQ} (8-hour) at 170 feet. While noise from the saw cutter is estimated to exceed the 75-dBA L_{EQ} (8-hour) limit at the property line, the property line under consideration is at the edge of the roadway right-of-way (where there is no sidewalk) and consists of a steep bank that would not feasibly be used as open space. The County Noise Element (Table N-2, Noise Standards) defines "Private Usable Open Space" as "*usable* [emphasis added] open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies." Based on the presence of a steep bank at the property line, no

receptors would be present at this location and the area where noise the saw cutter is estimated to exceed the 75-dBA L_{EQ} (8-hour) limit would not qualify as usable space. Above the bank and at areas of the property where there is potential for receptors to be located, noise levels would be below the 75-dBA L_{EQ} limit. Noise levels at the actual usable areas of the property would be lower than those presented herein (66.0 dBA L_{EQ}) due to the bank that would provide noise attenuation.[2] Further, noise from the saw cutter would be limited to a very short duration (expected to be a total of two days for the Willow Glen Drive improvements). As such, potential construction noise impacts from the Willow Glen Drive improvements would be less than significant.

The loudest noise during the demolition phase of construction would occur from the use of a concrete saw. This would occur at the existing clubhouse and maintenance building, 250 feet from the project site property line and 450 feet from off-site occupied properties. At 250 feet, a concrete saw would generate a noise level of 68.6 dBA L_{EQ} (8-hour), and at 450 feet a concrete saw would generate a noise level of 63.5 dBA L_{EQ} (8-hour). Noise from demolition would be less than the 75-dBA L_{EQ} (8-hour) limit and impacts would be less than significant.

5.3 COMBINED AND CUMULATIVE OFF-SITE NOISE IMPACTS

5.3.1 Impact Analysis

5.3.1.1 Combined Operation and Existing Ambient Noise Impacts

Noise associated with the proposed project's operations (processing plant, grading, material extraction, and haul truck activities) was combined with existing noise levels associated with traffic along Willow Glen Drive to determine noise impacts to NSLUs anticipated to be subject to noise from both sources. Modeled receivers were those within residential groups 1-7, as well as at Hilton Head County Park and the isolated residence north of Willow Glen Drive (Isolated Residence 1; refer to Figure 5). Table 13, *Existing Plus Unmitigated Project Noise Levels*, presents the noise levels for the existing traffic along Willow Glen Drive in combination with the proposed project's unmitigated noise levels. As shown in Table 13, noise associated with the proposed project would result in an increase of 3 dB CNEL or more when noise levels exceed 60 dB CNEL at receivers within residential groups 1, 2, and 5; **therefore, noise impacts associated with the combination of the proposed project's operations and existing noise levels associated with traffic along Willow Glen Drive would be considered potentially significant at these three locations (Impact N-2).** While the Project would result in noise level increases of greater than 3 dB CNEL at Residential Groups 6 and 7, Isolated Residence 1, and Hilton Head County Park, overall noise levels would remain below 60 dB CNEL and, therefore, no impact would occur.

[2] The model used for this analysis (the Roadway Construction Noise Model) does not account for topographical shielding.

Table 13
EXISTING PLUS UNMITIGATED PROJECT NOISE LEVELS

Receiver Area	Existing CNEL	Existing + Project CNEL	Increase CNEL	Direct Impact?[1]
Residential Group 1	63.8	68.0	4.2	**Yes**
Residential Group 2	65.2	68.2	3.0	**Yes**
Residential Group 3	65.4	68.2	2.8	No
Residential Group 4	65.6	68.1	2.5	No
Residential Group 5	59.4	64.8	5.4	**Yes**
Residential Group 6	40.1	46.2	6.1	No[2]
Residential Group 7	45.5	51.4	5.9	No[2]
Isolated Residence 1	52.8	59.6	6.8	No[2]
Hilton Head County Park	45.4	52.8	7.4	No[2]

[1] A direct impact would occur if the project results in an increase of 3 dB CNEL above existing conditions and noise levels exceed 60 dB CNEL.
[2] While the Project would result in noise level increases of greater than 3 dB CNEL, overall noise levels would remain below 60 dB CNEL; therefore, no impact would occur.
CNEL = Community Noise Equivalent Level

Table 14, *Existing Plus Mitigated Project Noise Levels*, presents the noise levels for the existing traffic along Willow Glen Drive in combination with the proposed project's mitigated noise levels. As shown in Table 14, noise associated with the proposed project would not result in a 3 dB CNEL increase when noise levels exceed 60 dB CNEL at any of the modeled receiver locations, and impacts would be less than significant.

Table 14
EXISTING PLUS MITIGATED PROJECT NOISE LEVELS

Receiver Area	Existing CNEL	Existing + Project CNEL	Increase CNEL	Direct Impact?[1]
Residential Group 1	63.8	64.7	0.9	No
Residential Group 2	65.2	66.0	0.8	No
Residential Group 3[2]	65.4	66.5	1.1	No
Residential Group 4[2]	65.6	66.3	0.7	No
Residential Group 5	59.4	62.2	2.8	No

[1] A direct impact would occur if the project results in an increase of 3 dB CNEL above existing conditions and noise levels exceed 60 dB CNEL.
[2] Although a direct impact was not identified for Residential Groups 3 or 4 under this threshold (refer to Table 13), a potentially significant impact was identified for Residential Groups 3 and 4 under the exterior use area noise threshold (Impact N-1) and Residential Groups 3 and 4 are therefore subject to mitigation measure NOI-1. Mitigated noise levels for Residential Groups 3 and 4 are presented here for informational purposes.

5.3.1.2 Cumulative Off-site Impacts

The potential for a cumulative noise impact can occur when noise from multiple projects combines to increase noise levels above thresholds. A significant cumulative impact would occur if the project results in the exposure of any NSLU to an increase of 10 dB CNEL over pre-existing noise levels resulting in a combined exterior noise level of 60 dB CNEL or greater or if the project would contribute to an increase of 3 dB CNEL over existing conditions in the existing plus project plus cumulative scenario if that total is

above 60 dB CNEL. As shown on Table 15, *Existing Plus Cumulative Plus Unmitigated Project Noise Levels,* project operations combined with cumulative project traffic noise would result in an increase of 3 dB CNEL compared to existing conditions at receivers in residential groups 1, 2, 3, and 5, where noise levels would exceed 60 dB CNEL. Therefore, cumulative impacts would occur at these locations. In addition, because the project would result in more than a 1 dBA increase over existing plus cumulative conditions at these same receiver locations, impacts are considered cumulatively considerable. **Cumulative off-site noise impacts are identified as cumulatively significant (Impact N-3).**

Table 16, *Existing Plus Cumulative Plus Mitigated Project Noise Levels*, presents noise levels associated with mitigated project operational noise, existing noise, and cumulative project traffic noise along Willow Glen Drive. As shown in Table 16, mitigated project operational noise combined with cumulative project traffic noise would not result in an increase of 3 dB CNEL compared to existing conditions at any of the modeled receivers where noise levels would exceed 60 dB CNEL. Therefore, the proposed project, as mitigated through mitigation measure NOI-1, would not result in a cumulative noise impact.

Table 15
EXISTING PLUS CUMULATIVE PLUS UNMITIGATED PROJECT NOISE LEVELS

Receiver Area	Existing CNEL	Existing + Cumulative CNEL	Existing + Cumulative + Project CNEL	Existing + Cumulative + Project Change from Existing	Existing + Cumulative + Project Cumulative Impact?[1]	Existing + Cumulative + Project Change from Existing + Cumulative	Existing + Cumulative + Project Cumulatively Considerable Impact?[2]
Residential Group 1	63.8	64.1	68.1	4.3	Yes	4.0	**Yes**
Residential Group 2	65.2	65.5	68.4	3.2	Yes	2.9	**Yes**
Residential Group 3	65.4	65.7	68.4	3.0	Yes	2.7	**Yes**
Residential Group 4	65.6	65.9	68.3	2.7	No	2.4	No[3]
Residential Group 5	59.4	59.5	64.9	5.5	Yes	5.4	**Yes**
Residential Group 6	40.1	40.2	46.2	6.1	No	6.0	No[3]
Residential Group 7	45.5	45.6	51.4	5.9	No	5.8	No[3]
Isolated Residence 1	52.8	52.8	59.6	6.8	No	6.8	No[3]
Hilton Head County Park	45.4	45.7	52.8	7.4	No	7.1	No[3]

[1] A cumulative impact would occur if the project would cause: an increase of 10 dB CNEL over existing noise levels, resulting in a combined exterior noise level of 60 dB CNEL or greater; an increase of 3 dB CNEL over existing conditions in the existing plus project plus cumulative scenario if that total is above 60 dB CNEL; or if the project would cause interior noise levels in excess of 45 dB CNEL while also causing an increase at least 3 dB CNEL over existing conditions.

[2] A cumulatively considerable contribution to an identified cumulative impact would occur if the project would add more than 1 dBA to the cumulative noise increase.

[3] While the project would cause a change from the Existing + Cumulative scenario that is greater than 1 dBA, no cumulative impact was identified so the Project's contribution is not cumulatively considerable.

CNEL = Community Noise Equivalent Level

Table 16
EXISTING PLUS CUMULATIVE PLUS MITIGATED PROJECT NOISE LEVELS

Receiver Area	Existing CNEL	Existing + Cumulative CNEL	Existing + Cumulative + Project CNEL	Existing + Cumulative + Project Change from Existing	Existing + Cumulative + Project Cumulative Impact?[1]	Existing + Cumulative + Project Change from Existing + Cumulative	Existing + Cumulative + Project Cumulatively Considerable Impact?[2]
Residential Group 1	63.8	64.1	64.9	1.1	No	0.8	No
Residential Group 2	65.2	65.5	66.2	1.0	No	0.7	No
Residential Group 3	65.4	65.7	66.7	1.3	No	1.0	No
Residential Group 4[4]	65.6	65.9	66.6	1.0	No	0.7	No
Residential Group 5	59.4	59.5	62.3	2.9	No	2.8	No[3]

[1] A cumulative impact would occur if the project would cause: an increase of 10 dB CNEL over existing noise levels, resulting in a combined exterior noise level of 60 dB CNEL or greater; an increase of 3 dB CNEL over existing conditions in the existing plus project plus cumulative scenario if that total is above 60 dB CNEL; or if the project would cause interior noise levels in excess of 45 dB CNEL while also causing an increase at least 3 dB CNEL over existing conditions.

[2] A cumulatively considerable contribution to the cumulative impact would occur if the project would add more than 1 dBA to the cumulative noise increase.

[3] While the project would cause a change from the Existing + Cumulative scenario that is greater than 1 dBA, no cumulative impact was identified so the Project's contribution is not cumulatively considerable.

[4] Although a direct impact was not identified for Residential Group 4 under this threshold (refer to Table 15), a potentially significant impact was identified for Residential Group 4 under the exterior use area noise threshold (Impact N-1) and Residential Group 4 is therefore subject to mitigation measure NOI-1. Mitigated noise levels for Residential Group 4 are presented here for informational purposes.

CNEL = Community Noise Equivalent Level

5.3.1.3 Cumulative Noise Impacts from Adjacent Cumulative Project Construction

Residential group 9 would potentially be subject to simultaneous noise from the proposed project's mining operations and construction of the Ivanhoe Ranch project, which is proposed to occur immediately east of the northeastern portion of the proposed project site.[3] It is conservatively assumed that a dozer and scraper would operate simultaneously at the Ivanhoe Ranch project site for earthwork activities, and would represent the loudest construction activity. Based on the large area of the Ivanhoe Ranch site, these pieces of equipment would operate at varying distances from the receiver location at residential group 9. The distance from the receiver location to the center of the Ivanhoe Ranch site is approximately 2,300 feet; however, since large portions of earthwork would likely occur for extended periods of time closer to residential group 9 than 2,300 feet, for analysis purposes it is assumed that the equipment would operate at an average distance of 1,000 feet from the receiver at residential group 9. At a distance of 1,000 feet, a scraper and dozer would generate a noise level of 55.7 dBA L_{EQ}. It is assumed that construction activities for the Ivanhoe Ranch project would comply with the County construction noise ordinance hours of 7:00 a.m. to 7:00 p.m. Based on this, the calculated CNEL values at the modeled receiver in residential group 9 is 53.7 dB CNEL. Combined with the proposed project's unmitigated mining operation noise, the noise level at the receiver in residential group 9 would be 55.5 dB CNEL. Noise levels at the modeled receiver at residential group 9 would be below the applicable 60 dB CNEL threshold for residential uses. Therefore, cumulative noise impacts from adjacent cumulative project construction would be less than significant.

5.4 VIBRATION

5.4.1 Impact Analysis

5.4.1.1 Construction Vibration

The primary source of vibration during project construction would be a vibratory roller that would likely be used for soil and/or asphalt compaction for the site access roads and Willow Glen Drive improvements. The western access road would be located closer to off-site residences than the primary access road. Due to its mobile nature of operations, the use of vibratory roller during construction of the western site access road would occur at an average distance, over the course of a workday, of 220 feet from the nearest off-site vibration-sensitive land use, which is the residence located across Willow Glen Drive. A vibratory roller creates approximately 0.210 in/sec PPV at a distance of 25 feet. At a distance of 220 feet, a vibratory roller would create a PPV of 0.016 in/sec.[4] This would be below the distinctly perceptible vibration annoyance potential criteria of 0.035 in/sec PPV as provided in Caltrans' Transportation and Construction Vibration Guidance Manual (Caltrans 2020) for steady state sources. Use of a vibratory roller during construction of the proposed Willow Glen Drive improvements would occur approximately 170 feet from the nearest off-site occupied residence located across Willow Glen Drive, as measured from the portion of the Willow Glen Drive construction area closest to the residence. At a distance of 170 feet, a vibratory roller would create a PPV of 0.025 in/sec,* which is also below the 0.035 in/sec PPV criterion; therefore, construction vibration impacts would be less than significant.

[3] Although Isolated Residences 3 and 4 were considered for impacts as a result of the proposed project's mining operations, these residences are located within the Ivanhoe Ranch project site and would therefore no longer be present if the Ivanhoe Ranch project is developed.

[4] Equipment PPV = Reference PPV * $(25/D)^n$(in/sec), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receptor in feet, and n= 1.1 (the value related to the attenuation rate through the ground); formula from Caltrans 2020.

5.4.1.2 Operational Vibration

The most prominent source of vibration during mining operations would be the use of a low-profile haul truck or tractor-trailer for on-site transport of washed fines from the processing plant to backfill areas. Vibration levels from the low-profile haul truck were conservatively calculated using vibration levels of a larger dump truck, which would generate vibration levels of 0.076 in/sec PPV at 25 feet (Caltrans 2020). The project's haul truck/tractor-trailer is assumed for analysis purposes to operate as close as 150 feet from off-site occupied residences. This is a conservative assumption because the project would incorporate mining activity setbacks of 100 feet from residential properties. Considering this setback distance in combination with residential yard space and/or roadways between the Project's mining areas and residential dwelling units, use of a haul truck/tractor-trailer would likely occur at distances much greater than 150 feet from residential dwelling units. At a distance of 150 feet, a haul truck/tractor-trailer (conservatively modeled as a dump truck) would generate a vibration level of 0.010 in/sec PPV which would be below the distinctly perceptible vibration annoyance potential criteria of 0.035 in/sec PPV as provided in Caltrans' Transportation and Construction Vibration Guidance Manual (Caltrans 2020) for steady state sources. It should be noted that although the haul truck/tractor-trailer's vibration level is compared against Caltrans' steady state source threshold, the haul truck/tractor-trailer would be mobile and would not represent a constant source of vibration for a given receptor.

Loaded trucks hauling material away from the project site along Willow Glen Drive would also generate vibration as a result of the weight of the material. Residential dwellings along Willow Glen Drive are located as close as 100 feet from the travel lanes that would accommodate the project's loaded haul trucks. At a distance of 100 feet, a loaded truck would generate a vibration level of 0.016 in/sec PPV, which would be below the distinctly perceptible threshold. In addition, vibration events created by loaded haul trucks at any one residence would be infrequent and limited to durations of a few seconds as the trucks pass by. Vibration impacts from both on-site and off-site truck activity would be less than significant.

The screening machine located at the processing area would generate vibration during operation but would be over 800 feet from occupied properties and therefore would not subject these properties to substantial vibration, as manmade earthborne vibrations attenuate rapidly with distance (Caltrans 2020). Specific vibration data for the screening machine is not available at this time. To provide a conservative analysis, vibration levels associated with a vibratory roller, which is considered a high vibration-generating machine, are considered. A vibratory roller generates a vibration level of 0.210 in/sec PPV at 25 feet (Caltrans). At a distance of 800 feet, a vibratory roller would generate a vibration level of 0.005 in/sec PPV which is well below the distinctly perceptible vibration potential criteria of 0.035 in/sec PPV (Caltrans 2020). In addition, the screening machine would be mounted in sand, which is a vibration-dampening medium. Therefore, the screening machine would not generate substantial vibration at off-site occupied properties, and operational vibration impacts would be less than significant.

6.0 LIST OF PREPARERS

Charles Terry	County-approved Noise Consultant
Hunter Stapp	Acoustic Analyst
Joanne M. Dramko, AICP	Principal Noise Specialist, Quality Control Reviewer
Vanessa Toscano	Project Manager
Andrea Bitterling	Principal Planner

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Appendix A

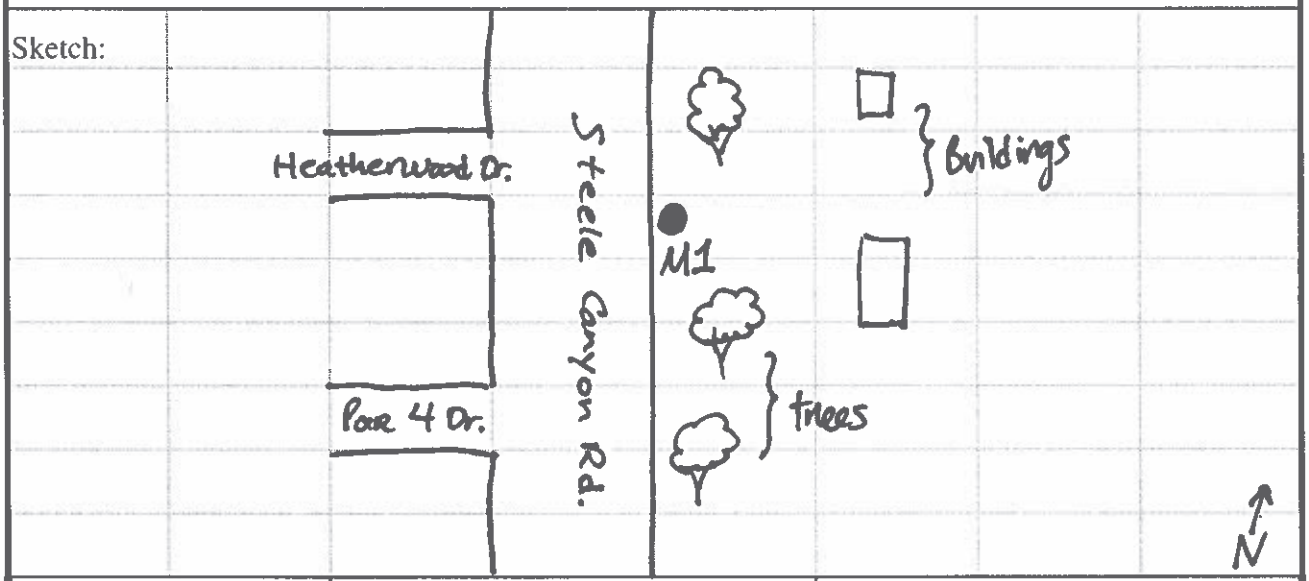
Site Visit Noise Measurement Sheets

Site Survey

Job # SIR-02	Project Name: Cottonwood Sand Mine		
Date: 1/3/19	Site #: M1	Engineer: Brendan Sullivan	
Address: Steele Canyon Road			
Meter: LD831	Serial #: 1741	Calibrator: CA250	Serial #: 1544

Notes: Very busy road; several cars + medium trucks. Distant helicopter noise. Sunny + clear skies.

Sketch:



Temp: 63° F	Wind Spd: 5 mph	Humidity: 23 %	
Start of Measurement: 1:52	End of Measurement: 2:07	75.7 dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 II	𝍸 𝍸	I
200 + 10 = 210 CARS	10 Medium trucks total	1 Heavy Truck total

Noise Measurement for Information Only

No Through Roadways

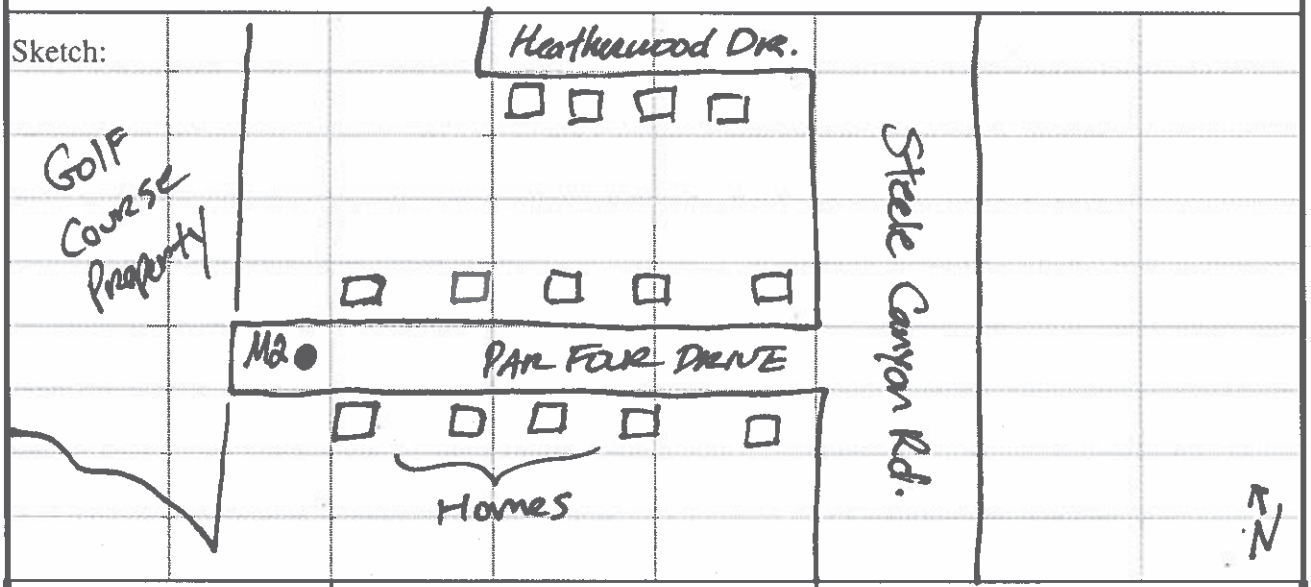
No Calibration Analysis Will Be Provided

Site Survey

Job # SIR-02	Project Name: Cottonwood Sand Mine		
Date: 1/3/19	Site #: M2	Engineer: Brandon Sullivan	
Address: PAR FOUR DRIVE			
Meter: LD831	Serial #: 1741	Calibrator: CA250	Serial #: 15444

Notes: Sunny + Clear skies. Distant leaf blower noise. Ambient nature sounds.

Sketch:



Temp: 63°F	Wind Spd: 5 mph	Humidity: 23 %	
Start of Measurement: 2:14	End of Measurement: 2:24	52.4 dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Site Survey

Job #: SIR-02		Project Name: Cottonwood Sand Mine	
Date: 1/3/19	Site #: M3	Engineer: Brendan Sullivan	
Address: Willow Glen Drive			
Meter: LD 831	Serial #: 1741	Calibrator: CA250	Serial #: 1544

Notes: Very busy Road w/ cars + trucks. Retaining wall at the base of the hill w/ homes at top.

Sketch:

Temp: 63°F	Wind Spd: 5 mph	Humidity: 23 %
Start of Measurement: 2:55	End of Measurement: 3:10	77.2 dBA L_{EQ}

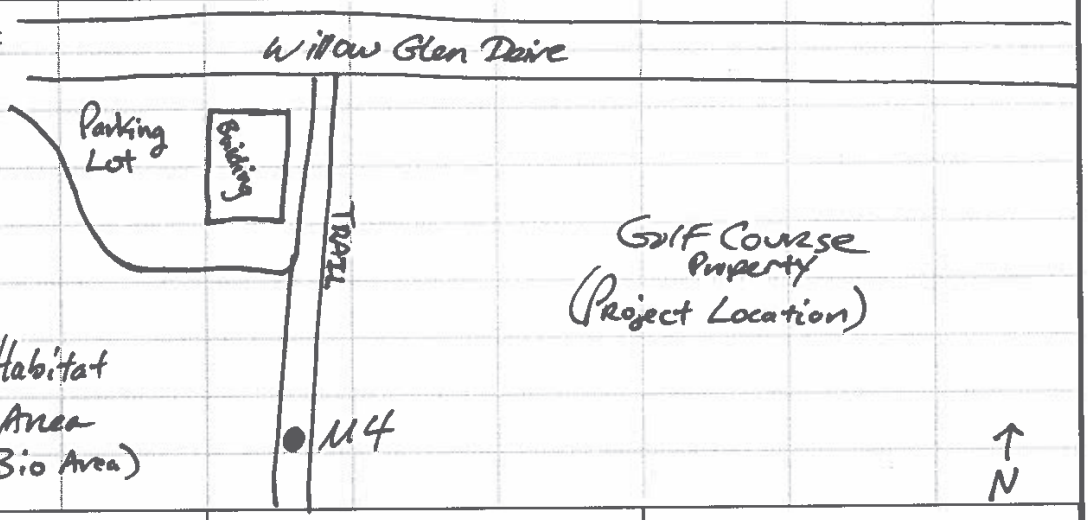
Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 || 385 total cars	𝍸 𝍸 𝍸 || 17 Medium trucks total	|||| 4 Heavy trucks total
Noise Measurement for Information Only		
No Through Roadways		
No Calibration Analysis Will Be Provided		

Site Survey

Job # SLR-02	Project Name: Cottonwood Sand Mine		
Date: 1/3/19	Site #: M4	Engineer: Brendan Sullivan	
Address: Bio Area			
Meter: LD831	Serial #: 1741	Calibrator: CA250	Serial #: 1544

Notes: Ambient nature sounds, distant traffic noise.

Sketch:



Temp: 64°	Wind Spd: 5 mph	Humidity: 23 %
Start of Measurement: 3:19	End of Measurement: 3:29	52.5 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

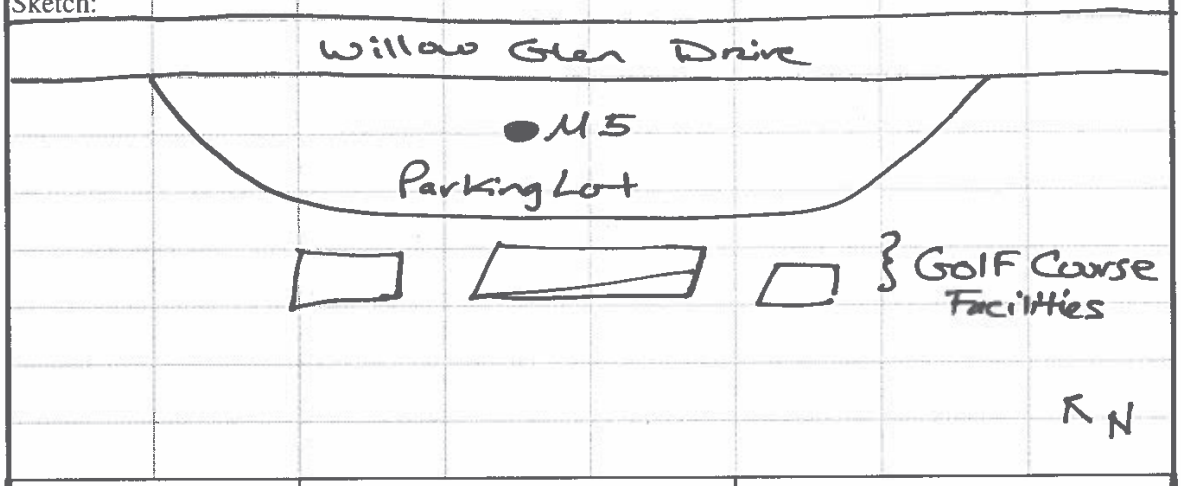
No Calibration Analysis Will Be Provided

Site Survey

Job # SLR-02	Project Name: Cottonwood Sand Mine		
Date: 1/3/19	Site #: M5	Engineer: Brendan Sullivan	
Address: Parking Lot on Willow Glen Drive			
Meter: LD 831	Serial #: 1741	Calibrator: CA250	Serial #: 1544

Notes: Noise from cars on Willow Glen Drive. Ambient Parking lot noise from cars at the golf course. & people

Sketch:



Temp: 62°	Wind Spd: 5 mph	Humidity: 23 %
Start of Measurement: 3:53	End of Measurement: 4:03	65.3 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

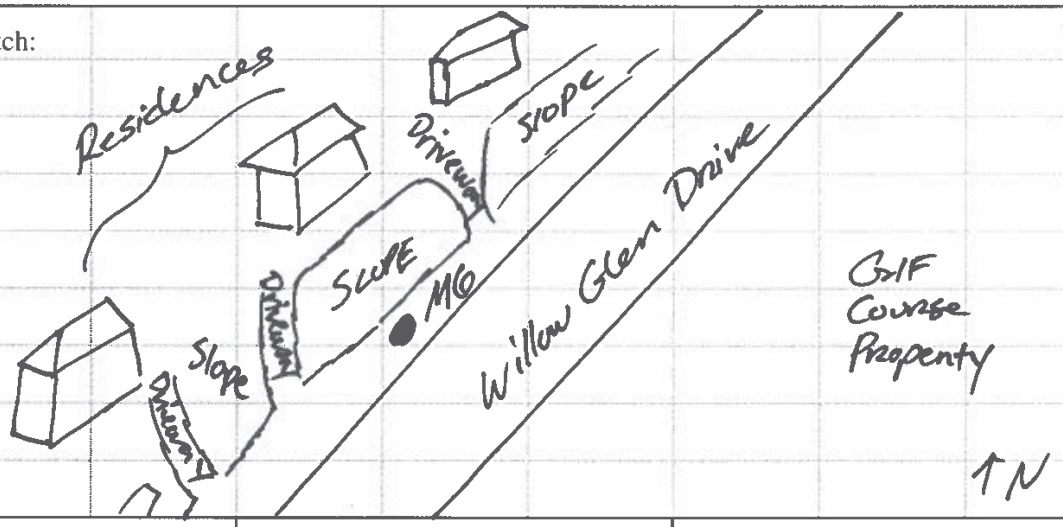
No Calibration Analysis Will Be Provided

Site Survey

Job # SIR-02		Project Name: Cottonwood Sand Mine	
Date: 1/3/19	Site #: M6	Engineer: Brendan Sullivan	
Address: Willow Glen Drive			
Meter: LD831	Serial #: 1741	Calibrator: CA250	Serial #: 1544

Notes: Cars driving very fast. Steep hill adjacent to the road with Residences.

Sketch:



Temp: 62°	Wind Spd: 5 mph	Humidity: 23 %
Start of Measurement: 4:17	End of Measurement: 4:32	76.7 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)
~~IIII IIII IIII IIII IIII IIII IIII~~ I 180 total Cars	IIII I 6 total Medium Trucks	0 Heavy Trucks

Noise Measurement for Information Only

No Through Roadways

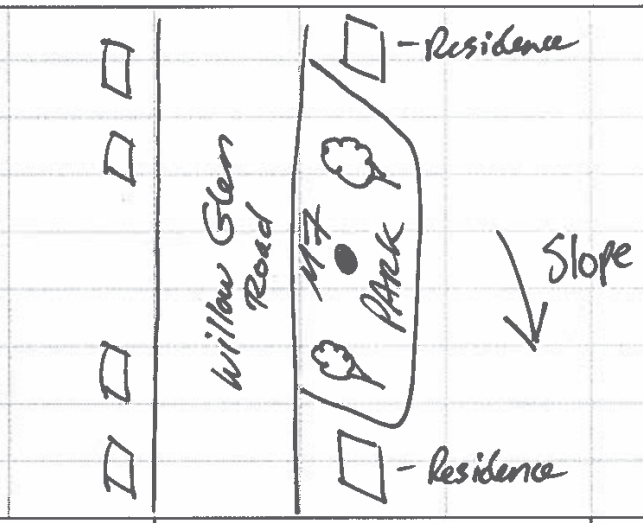
No Calibration Analysis Will Be Provided

Site Survey

Job # SLR-02		Project Name: Cottonwood Sand Mine	
Date: 1/3/19	Site #: M7		Engineer: Brandon Sullivan
Address: Wind River Road overlook			
Meter: LD 831	Serial #: 1741	Calibrator: CA250	Serial #: 1544

Notes: Sun starting to set. Neighborhood sounds: people talking, riding bikes, etc. Ambient noise from the valley below.

Sketch:



Temp: 60°	Wind Spd: 5 mph	Humidity: 23 %
Start of Measurement: 4:53	End of Measurement: 5:03	52.4 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

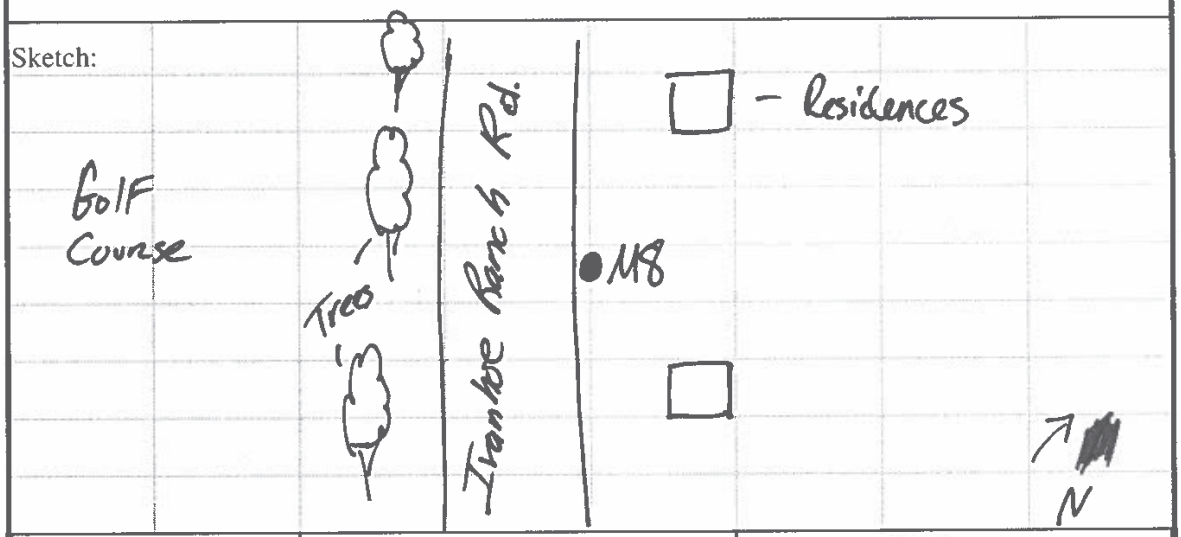
No Calibration Analysis Will Be Provided

Site Survey

Job # SIR-02	Project Name: Cottonwood Sand Mine		
Date: 1/3/19	Site #: M8	Engineer: Brendan Sullivan	
Address: Ivanhoe Ranch Road			
Meter: LD 831	Serial #: 1741	Calibrator: CA250	Serial #: 1544

Notes: Sun setting. Quiet Road near golf course w/ homes. Ambient nature sounds.

Sketch:



Temp: 60	Wind Spd: 5 mph	Humidity: [redacted] 23 %
Start of Measurement: 5:21	End of Measurement: 5:31	55.5 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Appendix B

Construction Noise Model Outputs

Primary Access Road

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	81.7	N/A	N/A	N/A	80.4	#	250.0	66.4	#	75	93.1
Bulldozer	81.7	40%	8	8	77.7	#	250.0	63.7	#	75	68.4
Loader	79.1	40%	8	8	75.1	#	250.0	61.1	#	75	50.7
Truck (Dump Truck, Flatbed Truck)	76.5	40%	8	8	72.5	#	250.0	58.5	#	75	37.6

Primary Access Road

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	81.7	N/A	N/A	N/A	80.4	#	500.0	60.4	#	75	93.1
Bulldozer	81.7	40%	8	8	77.7	#	500.0	57.7	#	75	68.4
Loader	79.1	40%	8	8	75.1	#	500.0	55.1	#	75	50.7
Truck (Dump Truck, Flatbed Truck)	76.5	40%	8	8	72.5	#	500.0	52.5	#	75	37.6

Western Access Road

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	81.7	N/A	N/A	N/A	80.4	#	100.0	74.4	#	75	93.1
Bulldozer	81.7	40%	8	8	77.7	#	100.0	71.7	#	75	68.4
Loader	79.1	40%	8	8	75.1	#	100.0	69.1	#	75	50.7
Truck (Dump Truck, Flatbed Truck)	76.5	40%	8	8	72.5	#	100.0	66.5	#	75	37.6

Western Access Road

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	81.7	N/A	N/A	N/A	80.4	#	220.0	67.5	#	75	93.1
Bulldozer	81.7	40%	8	8	77.7	#	220.0	64.9	#	75	68.4
Loader	79.1	40%	8	8	75.1	#	220.0	62.3	#	75	50.7
Truck (Dump Truck, Flatbed Truck)	76.5	40%	8	8	72.5	#	220.0	59.7	#	75	37.6

Grading

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	85.0	N/A	N/A	N/A	81.0	#	250.0	67.0	#	75	100.0
Grader	85.0	40%	8	8	81.0	#	250.0	67.0	#	75	100.0

Grading

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	85.0	N/A	N/A	N/A	81.0	#	500.0	61.0	#	75	100.0
Grader	85.0	40%	8	8	81.0	#	500.0	61.0	#	75	100.0

Demolition

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	89.6	N/A	N/A	N/A	82.6	#	250.0	68.6	#	75	120.1
Concrete Saw	89.6	20%	8	8	82.6	#	250.0	68.6	#	75	120.1

Demolition

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	89.6	N/A	N/A	N/A	82.6	#	450.0	63.5	#	75	120.1
Concrete Saw	89.6	20%	8	8	82.6	#	450.0	63.5	#	75	120.1

Willow Glen Drive CS

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	89.6	N/A	N/A	N/A	76.6	#	170.0	66.0	#	75	60.0
Concrete Saw	89.6	20%	2	8	76.6	#	170.0	66.0	#	75	60.0

Willow Glen Drive CS

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	89.6	N/A	N/A	N/A	76.6	#	50.0	76.6	#	75	60.0
Concrete Saw	89.6	20%	2	8	76.6	#	50.0	76.6	#	75	60.0

Willow Glen Drive DTT

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	81.7	N/A	N/A	N/A	73.8	#	170.0	63.2	#	75	43.8
Bulldozer	81.7	40%	2	8	71.7	#	170.0	61.1	#	75	34.2
Water Truck	80.0	20%	2	8	67.0	#	170.0	56.4	#	75	19.9
Truck (Dump Truck, Flatbed Truck)	76.5	40%	2	8	66.5	#	170.0	55.9	#	75	18.8

Willow Glen Drive DTT

Equipment	dBA L_{MAX}	Percentage Use per Hour	Use per Day (hours)	Ordinance Day (hours)	LEQ dBA (Daily)		Equipment Distance (feet)	LEQ dBA (Daily)		Ordinance Limit (dBA)	Distance to Ordinance Limit (feet)
Noise Sum	81.7	N/A	N/A	N/A	73.8	#	50.0	73.8	#	75	43.8
Bulldozer	81.7	40%	2	8	71.7	#	50.0	71.7	#	75	34.2
Water Truck	80.0	20%	2	8	67.0	#	50.0	67.0	#	75	19.9
Truck (Dump Truck, Flatbed Truck)	76.5	40%	2	8	66.5	#	50.0	66.5	#	75	18.8