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Subject: Noise Impact Study for the Desert Hot Springs Wind Energy Repowering Project

Dear Mr. Martin:

Dudek has completed an acoustical assessment for the proposed Desert Hot Springs Wind Energy Repowering Project (Project) located in the City of Desert Hot Springs (City) in Riverside County, California. The Project would produce up to approximately 17 megawatts (MW) of wind energy capacity. As proposed by the Desert Hot Springs Wind, LLC (Project Applicant), the repowering component of the Project would consist of up to four new wind turbines with a range of approximately 2.0 to 4.2 MW in nameplate capacity per turbine. In addition to the new wind turbines, the Project includes the following primary components:

- Decommissioning of approximately 69 existing wind turbines and the appropriate ancillary equipment
- Connection to an existing substation (Southern California Edison Venwind substation located on Assessor Parcel Number 516030014) through either a new underground or overhead collection line or an existing Southern California Edison 12-kilovolt overhead collection line
- Installation of one new temporary and one new permanent meteorological tower, each up to 309 feet tall
- Decommissioning of the new wind turbines at the end of their useful life cycle

This letter report summarizes the local criteria related to noise, describes the ambient noise measurements conducted for the Project, and presents the noise methodology used to model and compare the noise levels produced from the operation of the existing wind turbines prior to their decommissioning and the Project turbines. The resulting modeled noise levels are summarized herein. In addition, the Project noise levels are compared with the local regulations to draw conclusions about the significance level of the impacts. Construction and decommissioning noise and vibration impacts are also addressed.

REGULATORY SETTING

The Project is located within the City and falls under the City's General Plan Noise Element and Municipal Code. Below is a summary of City noise standards that relate to the Project.

City of Desert Hot Springs General Plan Noise Element

The City (City of Desert Hot Springs, 2000) sets forth a series of Goals, Policies and Programs pertaining to noise/land use compatibility. Among these, the following addresses noise from wind energy conversion systems (WECs):

Policies

Policy 6

The City shall assure that noise impacts from existing and future windfarm development shall be kept at a level compatible with residential and other sensitive land uses.

Program 6A

The City shall require that applications for windfarm development (WECS: Wind Energy Conservation Systems) include technical data on noise generation and projected noise contours. Following installation, noise monitoring shall be performed in conformance with requirements of the City, with adverse impacts to be fully mitigated.

Responsible Agency: Community Development Department; County Environmental Health

Schedule: Immediately/ Continuous.

In California and the City specifically, a CNEL of 65 dBA is used as a standard for maximum outdoor noise levels in residential areas.

City of Desert Hot Springs Municipal Code

A Conditional Use Permit for a WECS shall adhere to the following standard and development criteria in regards to noise.

1. No WECS shall be located closer than 1,200 feet from any residence, hotel, hospital, school, library or convalescent home unless the owner of such structure waives, in writing, the setback requirement.

2. Notwithstanding the 1,200-foot setback requirement specified above, a lesser setback may be permitted where due to factors of topography or the characteristics of the proposed WECS project, the approving entity finds that the noise, aesthetic or other environmental impacts of the project on adjacent properties will not be any more significant than if the 1,200-foot setback were applied.
3. A commercial WECS or WECS array shall not be operated inconsistent with the provision of Section 17.40.180, in which the following provisions shall apply:
    a. In residential areas, no exterior noise level shall exceed 65 dBA and no interior noise level shall exceed 45 dBA.
    b. All residential developments shall incorporate the following standards to mitigate noise levels:
        i. Increase the distance between the noise source and receiver.
        ii. Locate land uses not sensitive to noise (i.e., parking lots, garages, maintenance facilities, utility areas, etc.) between the noise source and the receiver.
        iii. Bedrooms should be located on the side of the structure away from major rights-of-way.
        iv. Quiet outdoor spaces may be provided next to a noisy right-of-way by creating a U-shaped development which faces away from the right-of-way.
    c. The minimum acceptable surface weight for a noise barrier is 4 pounds per square foot (equivalent to .75-inch plywood). The barrier shall be of a continuous material which is resistant to sound including: (1) masonry block; (2) precast concrete; or (3) earth berm or a combination of earth berm with block concrete.
    d. Noise barriers shall interrupt the line of sight between noise source and receiver. (Prior code section 159.20.030(15)).

The City regulates noise from construction in its Municipal Code (Section 9.04.030) by regulating the allowable hours of construction activity. Construction is not permitted between the hours of 5:00 p.m. and 7:00 a.m. Monday through Saturday (or between the hours of 6:00 p.m. and 6:00 a.m. during daylight savings time). Furthermore, construction is not permitted on Sundays.

County of Riverside

Although the Project site is located entirely within the boundaries of the City of Desert Hot Springs, the nearest noise-sensitive receivers are located in an unincorporated area of Riverside

County. As such, this analysis also takes into account the Project's consistency with County-established noise regulations, in addition to the City's noise requirements.

County of Riverside General Plan Noise Element

Though there is minimal residential development in the immediate area where these wind turbines are located, the potential for noise and groundborne vibration in neighboring developed areas may occur. The Wind Implementation Monitoring Program, designed and implemented by the County, guides the policy direction for this area. In terms of defining significance of impacts, the County's noise standards would apply if noise from turbines on City land would have spillover effect on receptors on County land.

Wind Implementation Monitoring Program Policies

1. Enforce the Wind Implementation Monitoring Program (WIMP).
2. Encourage the replacement of outdated technology with more efficient technology with less noise impacts. (AI 105).

WECS are also defined as stationary noise producers under the General Plan Noise Element. The following noise policies identify mechanisms to measure and mitigate the noise emitted from stationary noise sources (County of Riverside 2015).

General Plan Noise Element Policies

1. Prohibit facility-related noise received by any sensitive use from exceeding the following worst-case noise levels: (AI 105)
   a. 45 dBA [A-weighted decibels]-10-minute L_{eq} [equivalent sound level] between 10:00 p.m. and 7:00 a.m.
   b. 65 dBA-10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.
2. Develop measures to control non-transportation noise impacts. (AI 105)
3. Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed and ensure that the recommended mitigation measures are implemented. (AI 105, 106, 109)

County of Riverside Ordinances

Maximum noise level limits are contained in the County's Ordinances (Ordinance No. 847). Specifically, no person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the County's sound level standards. For all residential development, except for General Plan land use designations Rural Residential (5 acres), Rural Mountainous (10 acres), and Rural Desert (10 acres), the noise standards are that the maximum noise level shall not exceed 55 dBA between the hours of 7:00 a.m. to 10:00 p.m. and 45 dBA between the hours of 10:00 p.m. and 7:00 a.m.

For Rural Residential (5 acres), Rural Mountainous (10 acres), and Rural Desert (10 acres), the maximum sound level limit is 45 dBA 24 hours a day (Ordinance No. 847).

Exemptions to these noise standards include WECS, provided such systems comply with the following WECS noise provisions (Riverside County Ordinance No. 348.4835):

1. A commercial WECS permit shall be granted and requires no acoustical studies if the applicant demonstrates that the proposed WECS or WECS array complies with the following standards.
    a. WECS arrays with 10 or fewer WECS (comprised of WECS designed "in accordance with proven good engineering practices") are setback 2,000 feet or more from the nearest receptor.
    b. WECS designed with the following characteristics shall be deemed "in accordance with proven good engineering practices."

        having at least 3 blades;

        upwind rotor;

        no furling;

        tapered and twisted blades; and

        airfoils designed to stall softly.
2. If the above standards are not met then a commercial WECS permit shall be granted provided the following:
    a. The projected WECS noise level at each receptor is at or below 55 dBA weighted.
        i. This threshold shall be reduced by 5 dBA where it is projected that pure tone noise will be generated.
        ii. A pure tone exists if the one-third octave band sound pressure level in the bandwidth of the tone exceeds the arithmetic average of the sound pressure levels on the two contiguous one-third octave bands by five dB [decibels] for center frequencies of 500 Hz [cycles per second, or Hertz] and above, and 8 dB for center frequencies between 160 and 400 Hz, and by 15 dB for center frequencies less than or equal to 125 Hz.
3. Where acoustical studies are required, and the WECS are not designed in "accordance with proven good engineering practices" as defined above, the low frequency noise shall not exceed the following at a receptor:
    a. 75 dB, C weighted (5 to 100 hertz) or Predicted C (PC) for non-implusive WECS.
    b. 67 dB, C weighted (5 to 100 hertz) or PC for impulsive WECS.

The County regulates noise from construction in its County Ordinances (Section 15.04.020; County of Riverside 2018) by regulating the allowable hours of construction activity within one-quarter mile of an occupied residence or residences. Construction is not permitted between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May. Exceptions to these standards may be allowed only with the written consent of the building official.

METHODOLOGY

A site visit was conducted to measure existing ambient noise levels in the vicinity of the Project site. Location data was provided for all existing on-site wind turbines. Wind turbine sound level modeling was conducted for the existing turbines on the Project site to establish baseline noise levels produced by the existing wind turbines.

A computer program called CadnaA (Computer Aided Noise Abatement) was used for the wind turbine noise analysis. CadnaA is a computer-modeling program for calculation, presentation, assessment, and prediction of environmental noise. Wind turbine data for both the existing wind turbines and the proposed wind turbines on the Project site were input into the computer model, along with topographical data and site plan information. The outdoor noise propagation formulas follow the ISO 9613 (attenuation of sound during propagation outdoors) standard. Based upon recent research for wind turbine modeling protocol (RSG 2016), a ground factor of 0.5 (G=0.5) and an addition of 2 dB was used. The modeling sound power levels for the proposed turbines are based on moderate to high wind speeds (10 mph to 20 mph) during operation, which represents the highest turbine noise levels and a conservative-level of analysis. For the existing turbines, an assumed wind speed of approximately 18 mph was used; this is consistent with the assumptions used for the noise analysis conducted for the previously proposed project (Hersh 1998). These parameters were set in the CadnaA model.

For the purposes of presenting accurate Project-related noise impacts, the off-site turbines surrounding the Project site were included in the analysis. The noise analysis focused on removing the existing on-site turbines and adding the proposed turbines within the Project boundaries.

For the baseline or "Existing" scenario, the CadnaA model was used to model the existing wind turbine noise from the Project site and surrounding area turbines as point sources based on data provide by the Project Applicant (Desert Hot Springs Wind, LLC 2018). GIS data contained in the provided files included hub height details that were used for the model. When data on the hub height was not available, the height of existing turbines was assumed to be 80 feet (25 meters). All existing turbines were assumed to have a sound power (L_w) of 100 dBA based on previous wind turbine analyses for the vicinity wind projects (Hersh 1998). This corresponds to an average of the sound power levels (97 dB to 102.5 dB) for the existing turbines assessed previously.

For the "Proposed" scenario, the existing turbines on the Project site were deleted from the model and replaced with the four proposed wind turbines. All proposed wind turbines were conservatively assumed to have a 309-foot (94 meters) hub height. In addition, they were conservatively modeled with a sound power level of 110 dBA based on the Vestas 117 Model Turbine rated 3.45 MW, which is the turbine with the maximum sound power level among a number of potential turbines under consideration for the Project. This sound power level corresponds to expected wind speeds from 10 mph to 20 mph.

Temporary noise and vibration impacts from decommissioning of the existing turbines and construction of the proposed turbines were assessed using the Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM) (FHWA 2008). Although the model was funded and promulgated by the FHWA, the RCNM is often used for non-roadway projects, because the same types of construction equipment used for roadway projects are also used for other project types. Input variables for the RCNM consist of the receiver/land use types, the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of hours the equipment typically works per day), and the distance from the noise-sensitive receiver. No topographical or structural shielding was assumed in the modeling. The RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis.

EXISTING CONDITIONS

Existing Ambient Noise Levels

Dudek visited the Project site on August 3, 2017, and August 4, 2017, to measure ambient sound levels in the Project vicinity. Figure 1 shows the measurement locations in relation to the Project boundaries. The following parameters were recorded during noise measurements:

4. Average wind speed: 7 mph
5. Gust wind speed: 16 mph
6. Wind direction: East
7. Temperature: 95°–101° Fahrenheit
8. Relative humidity: 15%–20%

9. General weather conditions: overcast and partly cloudy
10. Terrain (e.g., hills, level, ravines): desert
11. Surrounding vegetation: small bushes, mostly open desert

Short-term (ST#) measurements were conducted with a calibrated Rion NL-62 sound level meter placed on a tripod with the microphone positioned approximately 5 feet above the ground. The meter was set with the slow time constant. The short-term measurements were 10 minutes long. The measurements were conducted during typical weekday, mid-day conditions; during the noise measurements, some of the existing turbines on-site and in the surrounding area were operational. The locations of the short-term measurements were selected in order to obtain a varied yet accurate understanding of the existing ambient noise environment in the surrounding Project area.

Table 1 presents the results of the short-term noise measurements. L_{eq} [equivalent continuous sound level] and the statistical sound levels ($L_{##}$) as mentioned in the Municipal Code. The Appendix includes a definition of statistical levels.

Table 1
Short-Term Sound Level Measurements

Measurement	Primary Observed Noise Source	Time HH:MM	L_{eq}[1]	L_{50}	L_{80}	L_{90}	L_{99}
			(dBA)				
ST1	Traffic	1:25 p.m. to 1:35 p.m.	50.7	39.2	37.6	37.1	36.5
ST2	Wind Turbines	1:05p.m. to 1:15 p.m.	46	43.4	42	41.3	39
ST3	Traffic	1:50 p.m. to 2:00 p.m.	56.1	43	38.3	37.1	35.6
ST4	Traffic	12:44 p.m. to 12:54 p.m.	48.6	43.7	42.2	41.6	40.6
ST5	Traffic	12:27 p.m. to 12:37 p.m.	49.4	48.2	45.1	43.5	38.8
ST6	Traffic	12:09 p.m. to 12:19 p.m.	42.9	41.3	39.2	38.6	37.5

Notes:
1 Equivalent Continuous Sound Level (Time-Average Sound Level)
* Conditions: Temperature: 95–101° Fahrenheit, party cloud and overcast, low to 5 miles-per-hour light/gusty east wind

The long-term measurements were completed using two SoftDB Model Piccolo sound level meters. The Piccolo sound level meters meet the ANSI standard for a Type 2 general-purpose sound level meter. The meters collected hourly measurements from midmorning on August 3, 2017 until midday on August 4, 2017. Those hourly equivalent levels (L_{eq}) were averaged together to produce the results presented in Table 2. Averages for the daytime and nighttime are presented as a reference of existing noise levels in the vicinity.

Table 2
Long-Term Sound Level Measurements

Site	Location Description	(dBA)			
		Daytime Average Noise Levels 7a.m.–10p.m. L_{eq}	*Nighttime Average Noise Levels 10p.m.–7a.m. L_{eq}*	*L_{dn}*	*CNEL*
LT1	East of existing turbine arrays in the vicinity	54	62	69	70
LT2	On ridge east of existing hillside turbines	47	52	59	59

Both long term monitors measured higher noise levels during the nighttime hours than during the daytime. These high noise levels correlate with wind data that was provided by the Project Applicant during the same time period. Between about 8:30 p.m. on August 3, 2017 and 4:30 a.m. on August 4, 2017, sustained wind speeds above 10 mph were reported. Typical daytime wind speeds were lower than 10 mph during the measurements. The higher wind speeds observed at night are likely the cause of the higher measured noise levels relative to daytime.

EXISTING CONDITIONS ANALYSIS

As detailed above, the CadnaA model was used to model the noise from existing wind turbines from the Project site and surrounding area. Table 3 presents the calculated existing noise levels at measurement and modeling receiver locations. As shown, modeled noise levels from the existing turbines range from approximately 36 dB(A) L_{eq} at receiver ST3 to approximately 55 dB(A) L_{eq} at receiver ST1. Figure 2 shows the noise contours (i.e., lines of equal sound level) from the existing on-site turbines. Due to the size of the input and output files from the CadnaA analysis (Attachment B), these files will be provided upon request.

Table 3
Existing Modeled Noise Level Result

ID	Location Description	Hourly L_{eq} dB(A)
ST1	Super Creek and Windhaven Road	55
ST2	Sunrise Drive	51
ST3	Bonnie Bell	36
ST4	Fairview Road and Matilija Road	44
ST5	Oceander Street	44
ST6	Esparta Avenue and Sierra Boulevard	41
M1	Country View Road	44
M2	Estrelita Drive	42

M3	Tan Alto Drive	40
M4	Westside Drive	50

PROJECT ANALYSIS

a) Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Decommissioning and Construction

Less-Than-Significant Impact. Decommissioning and construction noise are temporary phenomena; it is estimated that these activities would commence in November 2018 and would last approximately 13 months, ending in December 2019. The activities associated with decommissioning of the existing turbines would be similar to construction of the new turbines in terms of the equipment used and activities conducted; thus, potential decommission noise impacts are addressed here along with possible construction noise impacts.

The closest area of disturbance associated with construction of the new turbines will be located approximately 1,900 feet from the nearest sensitive-receptor land use (resident), while the nearest area of disturbance associated with improvements to the access road will be located approximately 250 feet from the closest residence. The closest residence would also be subject to daily pass-bys of construction worker vehicles (anticipated to range from approximately 12 to 24 per day) and vendor trucks (anticipated to range from approximately 2 to 28 per day).

Construction noise levels will vary from hour to hour and day to day, depending on the equipment in use, the operations being performed, and the distance between the source and receptor. Construction equipment with substantially higher noise-generation characteristics (such as pile drivers, rock drills, blasting equipment) would not be necessary, although jackhammers and/or backhoe-mounted impact hammers (hoe rams) may be necessary during existing turbine decommissioning.

Noise from construction activities varies based upon several factors, including the specific equipment types, size of equipment used, percentage of time in use, condition of each piece of equipment, and number of pieces of equipment that will actually operate on site. The construction vehicle assemblage would include standard equipment such as cranes, excavators, man lifts, graders, rollers, dozers, trackers, and miscellaneous trucks.

The magnitude of the impact would depend on the type of construction activity, equipment, duration of the construction phase, distance between the noise source and receiver, and any intervening structures. The typical operating cycles for construction equipment involve one or two minutes of full power operation followed by three or four minutes at lower power settings. Noise from construction equipment generally exhibits point source acoustical characteristics. A point source sound is attenuated (is reduced) at a rate of 6 dB per doubling of distance from the source for "hard site" conditions and at 7.5 dB per doubling of distance for "soft site" conditions. A hard site is characterized by ground surface covered by pavement, or hard compacted soils; a soft site is characterized by ground covered with vegetation, or loose soil with a rough surface (such as tilled land). These rules apply to the propagation of sound waves with no obstacles between source and receivers, such as topography (ridges or berms) or structures.

Table 4 shows the calculated noise levels at nearby noise-sensitive receptors (i.e., the residential properties) during decommissioning and construction phases for the Project, employing the RCNM software and based on construction equipment defaults (i.e., construction equipment types) found in the air quality model CalEEMod for a project of this size and scope. More details from the RCNM analysis can be found in Attachment C.

Table 4
Construction / Decommissioning Noise Modeling Summary Results

Construction Phase	L_{eq} (dBA)			
	ST4/M3 – Nearest Turbine Construction/ Decommissioning Work Distance (Approximately 1,900 feet)	*ST4/M3 – Typical Turbine Construction/ Decommissioning Work Distance (Approximately Receiver 3,000 feet)*	*ST1/M1 – Nearest Access Road Work Distance (Approximately Receiver 250 feet)*	*ST1/M1 – Typical Access Road Work Distance (Approximately Receiver 2,000 feet)*
Existing Turbine Decommissioning	53	50	n/a	n/a
Mobilization/Laydown	54	50	n/a	n/a
Site Prep/Grading	53	50	n/a	n/a
Collection Lines	54	51	n/a	n/a
Access Roads	53	50	70	50
Foundations	54	51	n/a	n/a
New Turbine Install	51	48	n/a	n/a

As shown in Table 4, when turbine construction and decommissioning would take place relatively near to the nearest receiver (ST4/M3, approximately 1,900 feet away), modeled noise levels would range from approximately 51 dBA L_{eq} to 54 dBA L_{eq}. Typical turbine decommissioning and construction-related noise levels are anticipated to range from approximately 48 to 51 dBA L_{eq} at the nearest residential properties, as represented by receiver ST4/M3 located to the southeast of the Project. The highest noise levels are anticipated to occur during the relatively brief periods in which access road improvements work could take place near residences. As shown in Table 4, when access road improvements take place at the nearest residences approximately 250 feet away, construction noise is estimated to be approximately 70 dBA L_{eq}; more typically, when construction would take place at greater distances, the noise level from access road work would be approximately 50 dBA L_{eq}.

Noise from construction worker vehicle and vendor truck pass-bys was estimated using the FHWA's Traffic Noise Model (TNM) version 2.5 (FHWA 2004). Conservatively assuming the maximum numbers of worker vehicles (24 per day) and heavy trucks (28 per day) occur simultaneously within the same hour[1], and assuming a travel speed of 15 miles per hour, the estimated noise level would be approximately 50 dBA L_{eq} at the nearest residence, approximately 250 feet from the access road. Assuming a more typical vehicle mix of 24 employees trips and 2 heavy trucks occurring during the same hour (as may realistically occur during the start and end of a construction day), the corresponding noise level would be approximately 39 dBA L_{eq} at the nearest residence.

While construction activities would temporarily increase daytime noise levels at noise-sensitive receptors, the expected increases will only be temporary and intermittent. The measured noise level at ST4 was approximately 49 dBA L_{eq} as shown in Table 1, and the measured noise level at ST1 was approximately 51 dBA L_{eq}. Periodically throughout the construction workday, the temporary noise from turbine construction would be slightly above this ambient noise level. For a relatively brief period, the noise level from access road construction would be higher than the ambient noise levels at the nearest residences. More typically, the temporary noise from access road improvements would be slightly below this ambient noise level. Similarly, worst-case traffic noise levels on the access road

[1] This is a highly conservative estimate because, based upon Table 4.2-6 (in the Air Quality section of this document), the maximum number of construction worker trips would not occur during the same construction phase as the maximum number of vendor trucks; additionally, it is highly unlikely that all 28 of the vendor trucks would arrive and/or depart during the same hour. It is more likely that the vendor trucks would be arriving and departing at intervals throughout the work day.

would be slightly below this ambient noise level, at 50 dBA L_{eq}. More typically, access road traffic noise would be well below this level at 39 dBA L_{eq}, and would be negligible.

The City regulates noise from construction in its Municipal Code (Section 9.04.030) by regulating the allowable hours of construction activity, as detailed above. The hours of construction for the Project would not extend beyond the hours permitted by the City.

Overall, Project construction and decommissioning would take place only during permitted hours, would be temporary and intermittent in nature, and would result in relatively low levels. In addition, the Project would be required to adhere to mitigation measures MM-NOI-81, MM-NOI-82, and MM-NOI-84, implementation of which would further minimize construction noise impacts. As such, noise levels from construction and decommissioning would not result in adverse effects to noise-sensitive users in the surrounding Project area.

Operation

Less-Than-Significant Impact. Table 5 shows the results from the wind turbine noise modeling during operations. Existing turbine modeled noise levels (from Table 3) are compared with the proposed turbines modeled noise levels, as well as with the City WECS noise standard. The noise level change due to the replacement of the existing turbines with the proposed turbines is shown in the final column of the Table 5. Figure 2 shows the noise contours (i.e., lines of equal sound level) from the existing on-site wind turbines, while Figure 3 shows the noise contours (i.e., lines of equal sound level) from the new on-site wind turbines.

Table 5
Wind Turbine Noise Modeling Results—Existing vs Proposed Turbines

Receiver ID	Receiver Location / Description	Hourly L_{eq} (dBA)		City of Desert Hot Springs WEC noise standard (65 dBA) Exceeded?	Change in Noise Level (dB)
		Existing Turbines	*Proposed Turbines*		
ST1	Super Creek and Windhaven Road	55	55	No	0
ST2	Sunrise Drive	51	51	No	0
ST3	Bonnie Bell	36	36	No	0
ST4	Fairview Road and Matilija Road	44	44	No	0
ST5	Oceander Street	44	44	No	0
ST6	Esparta Avenue and Sierra Boulevard	41	41	No	0
M1	Country View Road	44	44	No	0

Table 5
Wind Turbine Noise Modeling Results—Existing vs Proposed Turbines

Receiver ID	Receiver Location / Description	Hourly L_{eq} (dBA)		City of Desert Hot Springs WEC noise standard (65 dBA) Exceeded?	Change in Noise Level (dB)
		Existing Turbines	*Proposed Turbines*		
M2	Estrelita Drive	42	42	No	0
M3	Tan Alto Drive	40	40	No	0
M4	Westside Drive	50	50	No	0

As shown in Table 5, predicted noise levels produced by the proposed wind turbines would range from approximately 36 dBA L_{eq} at receiver ST3 to approximately 55 dBA L_{eq} at receiver ST1. The City noise standard of 65 dBA would not be exceeded at any of the modeled receiver locations. Additionally, when rounded to whole numbers, the change in noise level at the receiver locations as a result of the Project would be zero (0) dB[2]. The Project would not exceed applicable noise standards. Therefore, long-term operational impacts associated with the exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies would be less than significant.

Routine Project maintenance will include the periodic clearing of sand (as currently occurs) from within the switchyard fences and Project access roads due to high quantities of sand blowing into the area and accumulating in areas where wind velocities are slowed by fences, turbine towers, and utility poles.

To operate the existing wind energy facilities, the Project Applicant employs approximately 10 people. Once repowered, a similarly sized operations team would continue to work on the Project and on the Project site. No net increase in the number of people employed and working on the Project site would occur. Therefore, noise impacts related to routine project maintenance would be less than significant.

[2] The net change of zero (0) decibels is due to a combination of the existing turbines in the surrounding area which would remain in the future and which mask the noise from the new turbines, as well as the replacement of the old turbines on site with a fewer number of new turbines.

Future Decommissioning Emissions

The Project lifespan would be at least 30 years. When the proposed facility is decommissioned, the four wind turbines would be removed from the Project site and the materials would be reused or sold for scrap. Decommissioning activities are anticipated to result in similar intensity of impacts as those associated with decommissioning of the existing wind turbines. For this reason, impacts associated with future decommissioning of the Project's new wind turbines would be similar, if not nearly identical, to those impacts related to decommissioning of the existing 69 wind turbines that are currently found on-site.

b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less-Than-Significant Impact. The Project is not anticipated to include equipment or activities capable of producing substantial long-term groundborne vibration or groundborne noise levels. The wind turbines themselves would not generate significant levels of dynamic forces (as would, for example, a hammer hitting an anvil) that would be transmitted into the ground. Additionally, vehicles used for inspection and maintenance of the Project would ride on rubber tires, and vibration levels would be negligible. The only ground vibration potential would be associated with the short-term decommissioning and construction phases of the Project.

Groundborne vibration from construction (and by extension, decommissioning) activities is typically attenuated over short distances. The heavier pieces of construction equipment used on site would include cranes, excavators, bulldozers, graders, loaded trucks, and rollers. Additionally, backhoe-mounted impact hammers (hoe rams) or jackhammers may be utilized during decommissioning of the existing turbines. Based on published vibration data, the anticipated construction equipment would generate a maximum root mean square vibration level of approximately 94 VdB re 1 micro-inch/second at a distance of 25 feet from the source (FTA 2006). The closest existing residences are approximately 1,900 feet from the turbine construction area. At this distance and with the anticipated construction equipment, the root mean square vibration levels would be approximately 36.9 VdB. For access road improvements work, heavy equipment such as graders would be used, which would generate a maximum root mean square vibration level of approximately 87 VdB re 1 micro-inch/second at a distance of 25 feet from the source (FTA 2006). The closest existing residences to access road work are approximately 250 feet away. At this distance the root mean square vibration levels would be approximately 57 VdB. These levels would be far less than the recommended threshold of 80 VdB for human response within residential structures (FTA 2006). Vibration from construction equipment would be imperceptible and less than significant at noise-sensitive land uses.

With regards to potential for structural damage, the vibration levels are presented in terms of inches per second peak particle velocity (PPV). Based on published vibration data, the anticipated construction equipment would generate vibration levels of approximately 0.210 inches per second PPV at a distance of 25 feet from the source (FTA 2006). At the nearest existing residences located approximately 1,900 or more feet from the nearest heavy construction work, the resultant PPV would be approximately 0.0003 inches per second. For access road improvements work, heavy equipment such as graders would be used, which would generate vibration levels of approximately 0.089 inches per second at a distance of 25 feet from the source (FTA 2006). At the closest existing residences to access road work the resultant PPV would be approximately 0.0028 inches per second. These levels would be substantially less than the recommended threshold of 0.20 inches per second for potential of architectural damage to normal houses with plastered walls and ceilings. Therefore, impacts associated with groundborne vibration would be less than significant.

c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less-Than-Significant Impact. As documented in significance threshold (a), above, the noise increase from operation of the Project would be zero (0) dB, when rounded to whole numbers. The Project would not result in a substantial permanent increase in ambient noise levels. Therefore, long-term operational impacts associated with a substantial permanent increase in ambient noise levels in the Project vicinity would be less than significant.

d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less-Than-Significant Impact. Decommissioning and construction noise are the only temporary noise impacts associated with the Project. As documented in significance threshold (a), above, noise from Project construction and decommissioning would range from less than the measured ambient noise level in the Project area to about 5 dB above the ambient sound level at the nearest residences. Construction noise will at times be clearly perceptible at the nearest noise-sensitive receivers, particularly during the relatively brief periods in which access road improvement work takes place near residences.

However, given that Project construction and decommissioning would take place only during permitted hours (as required by the City's and County's noise standards), and due to the temporary and intermittent nature of the noise and the relatively low levels, noise levels from construction and decommissioning would not exceed significance thresholds. As such, noise levels from construction and decommissioning would not result in adverse effects to noise-sensitive users in the surrounding Project area. No new mitigation measures are required.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Less-Than-Significant Impact. The Project site is not located within an airport land use plan and is outside the Airport Influence Area Boundary of the Palm Springs International Airport (Riverside County 2005). The Project site is located approximately 9.1 miles northwest of the airport. The Project would not expose people residing or working in the area to excessive airport noise levels. Therefore, impacts associated with public airport noise would be less than significant.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Project site is not within the vicinity of a private airstrip (Airnav.com 2018). Therefore, no impacts associated with private airstrip noise would occur.

SUMMARY

Noise levels from the operation of wind turbines associated with the Project were analyzed and assessed herein. In addition, decommissioning and construction vibration and noise impacts from the Project were analyzed and evaluated as well. Based upon the preceding analyses, the Project would have a less than significant noise impact.

Should you have any questions regarding the information presented in this report, please call me at 949.373.8329.

Sincerely,

Mike Greene, INCE Bd. Cert.
Environmental Acoustician
mgreene@dudek.com

Att.: Figures 1–3
Attachment A – Definitions
Attachment B – Operational Noise Modeling Input/Output
Attachment C – Construction Noise Modeling Input/Output
Attachment D – Resume

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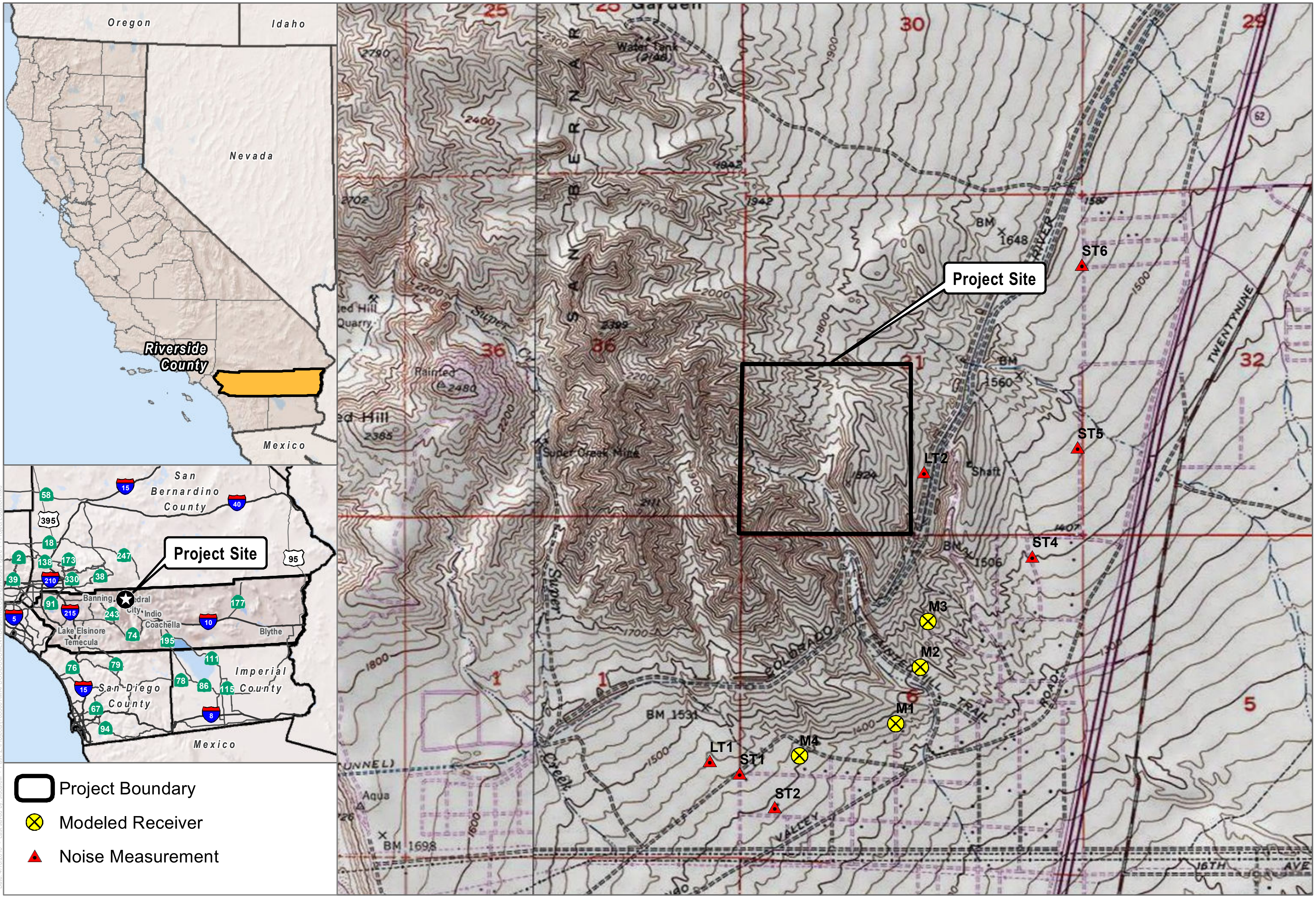


SOURCE: USGS 7.5 minute Desert Hot Springs Quadrangle

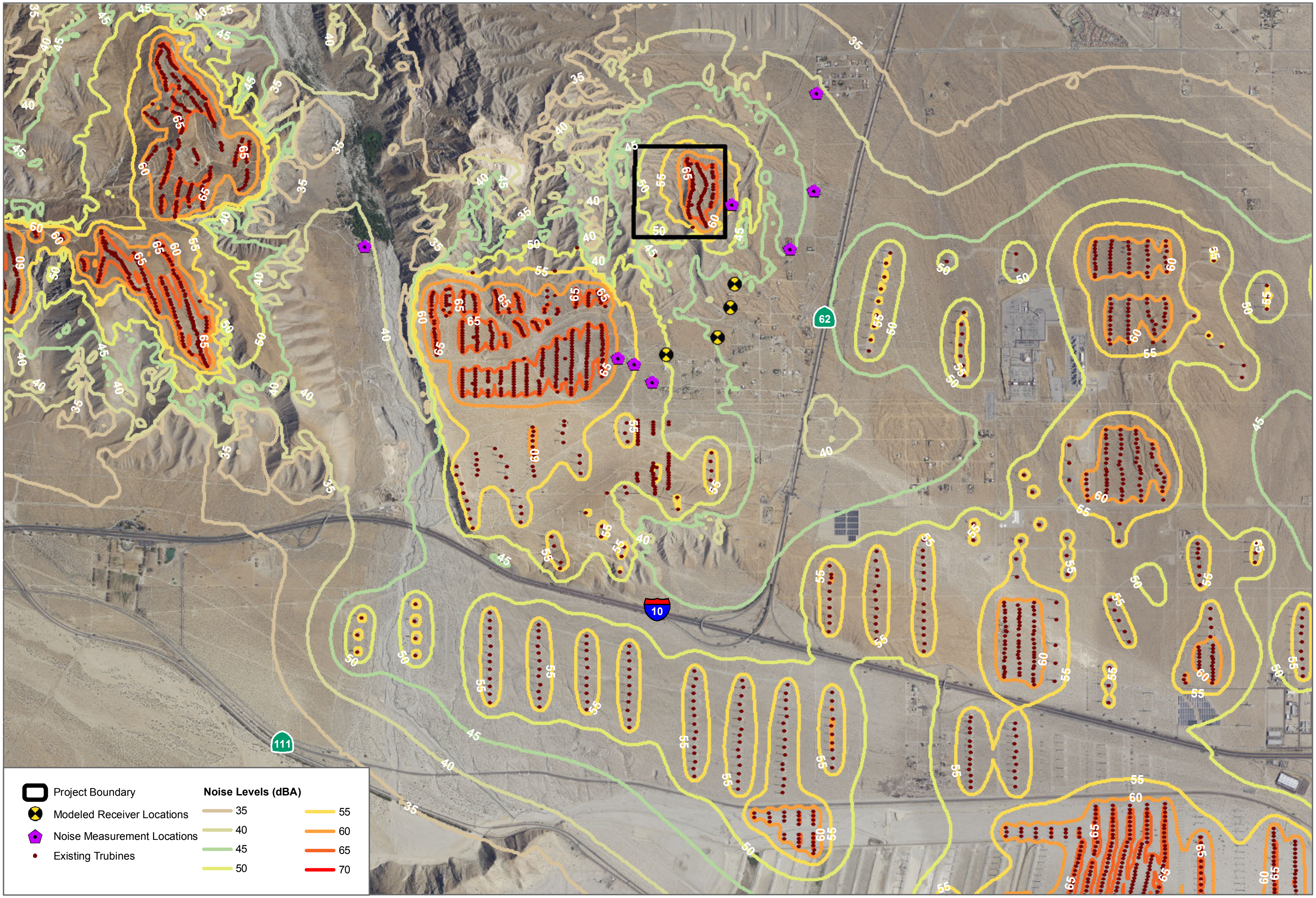
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Desert Hot Springs Wind Energy Repowering Project



SOURCE: NAIP 2016

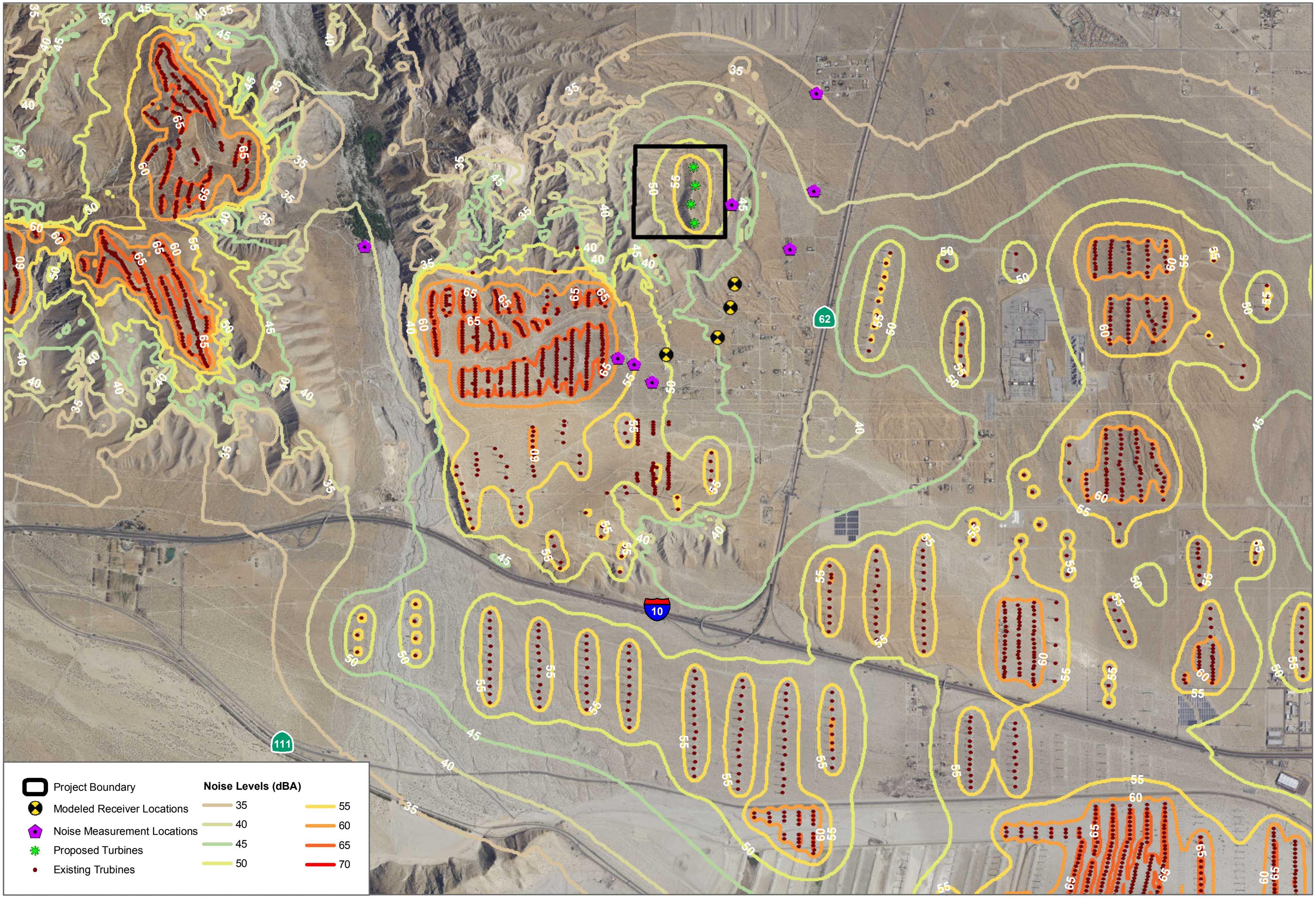
DUDEK

0 0.5 1 Miles

FIGURE 2

Existing Wind Turbine Noise Contours

Desert Hot Springs Wind Energy Repowering Project



SOURCE: NAIP 2016

DUDEK

0 0.5 1 Miles

FIGURE 3

Proposed Wind Turbine Noise Contours

Desert Hot Springs Wind Energy Repowering Project

ATTACHMENT A

Definitions

ATTACHMENT A
Definitions

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear.
Community Equivalent Sound Level (CNEL)	CNEL is the A-weighted equivalent continuous sound pressure level for a 24-hour period with a 10 dB adjustment added to sound levels occurring during the nighttime hours (10 p.m. to 7 a.m.) and 5 dB added to the sound during the evening hours (7 p.m. to 10 p.m.).
Day Night Level (DNL or L_{dn})	Similar to the CNEL, the DNL is the A-weighted equivalent continuous sound pressure level averaged over a 24-hour period. The only difference between the DNL and the CNEL is that the evening penalty of 5 dB (between 7 p.m. and 10 p.m.) is not included in this level.
Decibel (dB)	A unit for measuring sound pressure level, equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micropascals.
L_{eq}	Energy equivalent level, which is the equivalent steady-state sound level that, in a stated period of time, contains the same acoustical energy as a time-varying sound during the same time period. An L_{eq} level is computed by summing the noise energy over the stated time period using mathematical integration.

Statistical Sound Level ($L_{##}$)	A sound level metric describing the level exceeded for the percent of the time. For example, the L_{90} would be the sound level exceeded for 90% of the measurement time.

ATTACHMENT B

Operational Noise Modeling Input/Output

(Provided upon request due to large file size)

ATTACHMENT C

Construction Noise Modeling Input/Output

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018
Case Description: Desert Hot Springs_Collection

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2000	0
Excavator	No	40		80.7	2000	0
Man Lift	No	20		74.7	2000	0
Man Lift	No	20		74.7	2000	0
Grader	No	40	85		2000	0
Roller	No	20		80	2000	0
Dozer	No	40		81.7	2000	0
Tractor	No	40	84		2000	0
Slurry Trenching Machine	No	50		80.4	2000	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Excavator		48.7	44.7	N/A	N/A	N/A	N/A	N/A
Man Lift		42.7	35.7	N/A	N/A	N/A	N/A	N/A
Man Lift		42.7	35.7	N/A	N/A	N/A	N/A	N/A
Grader		53	49	N/A	N/A	N/A	N/A	N/A
Roller		48	41	N/A	N/A	N/A	N/A	N/A
Dozer		49.6	45.6	N/A	N/A	N/A	N/A	N/A
Tractor		52	48	N/A	N/A	N/A	N/A	N/A
Slurry Trenching Machine		48.3	45.3	N/A	N/A	N/A	N/A	N/A
	Total	53	54.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

Equipment
Spec Actual Receptor Estimated

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Crane	No	16		80.6	3000	0
Excavator	No	40		80.7	3000	0
Man Lift	No	20		74.7	3000	0
Man Lift	No	20		74.7	3000	0
Grader	No	40	85		3000	0
Roller	No	20		80	3000	0
Dozer	No	40		81.7	3000	0
Tractor	No	40	84		3000	0
Slurry Trenching Machine	No	50		80.4	3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Excavator		45.1	41.2	N/A	N/A	N/A	N/A	N/A
Man Lift		39.1	32.1	N/A	N/A	N/A	N/A	N/A
Man Lift		39.1	32.1	N/A	N/A	N/A	N/A	N/A
Grader		49.4	45.5	N/A	N/A	N/A	N/A	N/A
Roller		44.4	37.4	N/A	N/A	N/A	N/A	N/A
Dozer		46.1	42.1	N/A	N/A	N/A	N/A	N/A
Tractor		48.4	44.5	N/A	N/A	N/A	N/A	N/A
Slurry Trenching Machine		44.8	41.8	N/A	N/A	N/A	N/A	N/A
	Total	49.4	50.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018
Case Description: Desert Hot Springs_Foundation Removal - 1

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2000	0
Compressor (air)	No	40		77.7	2000	0
Crane	No	16		80.6	2000	0
Generator	No	50		80.6	2000	0
Generator	No	50		80.6	2000	0

Tractor		No	40	84		2000	0
Front End Loader		No	40		79.1	2000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Compressor (air)		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Generator		48.6	45.6	N/A	N/A	N/A	N/A	N/A
Generator		48.6	45.6	N/A	N/A	N/A	N/A	N/A
Tractor		52	48	N/A	N/A	N/A	N/A	N/A
Front End Loader		47.1	43.1	N/A	N/A	N/A	N/A	N/A
	Total	52	52.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

				Equipment			
				Spec	Actual	Receptor	Estimated
		Impact		Lmax	Lmax	Distance	Shielding
Description		Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)		No	40		77.7	3000	0
Compressor (air)		No	40		77.7	3000	0
Crane		No	16		80.6	3000	0
Generator		No	50		80.6	3000	0
Generator		No	50		80.6	3000	0
Tractor		No	40	84		3000	0
Front End Loader		No	40		79.1	3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		42.1	38.1	N/A	N/A	N/A	N/A	N/A
Compressor (air)		42.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Generator		45.1	42.1	N/A	N/A	N/A	N/A	N/A
Generator		45.1	42.1	N/A	N/A	N/A	N/A	N/A
Tractor		48.4	44.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		43.5	39.6	N/A	N/A	N/A	N/A	N/A
	Total	48.4	49.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018
Case Description: Desert Hot Springs_Foundation Removal - 2

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2000	0
Compressor (air)	No	40		77.7	2000	0
Crane	No	16		80.6	2000	0
Generator	No	50		80.6	2000	0
Generator	No	50		80.6	2000	0
Tractor	No	40	84		2000	0
Front End Loader	No	40		79.1	2000	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax
Compressor (air)		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Compressor (air)		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Generator		48.6	45.6	N/A	N/A	N/A	N/A	N/A
Generator		48.6	45.6	N/A	N/A	N/A	N/A	N/A
Tractor		52	48	N/A	N/A	N/A	N/A	N/A
Front End Loader		47.1	43.1	N/A	N/A	N/A	N/A	N/A
	Total	52	52.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	3000	0

Compressor (air)	No	40		77.7	3000	0
Crane	No	16		80.6	3000	0
Generator	No	50		80.6	3000	0
Generator	No	50		80.6	3000	0
Tractor	No	40	84		3000	0
Front End Loader	No	40		79.1	3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		42.1	38.1	N/A	N/A	N/A	N/A	N/A
Compressor (air)		42.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Generator		45.1	42.1	N/A	N/A	N/A	N/A	N/A
Generator		45.1	42.1	N/A	N/A	N/A	N/A	N/A
Tractor		48.4	44.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		43.5	39.6	N/A	N/A	N/A	N/A	N/A
	Total	48.4	49.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018

Case Description: Desert Hot Springs_Foundations

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Excavator	No	40		80.7	2000	0
Man Lift	No	20		74.7	2000	0
Grader	No	40	85		2000	0
Roller	No	20		80	2000	0
Dozer	No	40		81.7	2000	0
Dozer	No	40		81.7	2000	0
Tractor	No	40	84		2000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax

Excavator		48.7	44.7	N/A	N/A	N/A	N/A	N/A
Man Lift		42.7	35.7	N/A	N/A	N/A	N/A	N/A
Grader		53	49	N/A	N/A	N/A	N/A	N/A
Roller		48	41	N/A	N/A	N/A	N/A	N/A
Dozer		49.6	45.6	N/A	N/A	N/A	N/A	N/A
Dozer		49.6	45.6	N/A	N/A	N/A	N/A	N/A
Tractor		52	48	N/A	N/A	N/A	N/A	N/A
	Total	53	54.2	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Excavator	No	40		80.7	3000	0
Man Lift	No	20		74.7	3000	0
Grader	No	40	85		3000	0
Roller	No	20		80	3000	0
Dozer	No	40		81.7	3000	0
Dozer	No	40		81.7	3000	0
Tractor	No	40	84		3000	0

				Results				
		Calculated (dBA)			Noise Limits (dBA)			
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator		45.1	41.2	N/A	N/A	N/A	N/A	N/A
Man Lift		39.1	32.1	N/A	N/A	N/A	N/A	N/A
Grader		49.4	45.5	N/A	N/A	N/A	N/A	N/A
Roller		44.4	37.4	N/A	N/A	N/A	N/A	N/A
Dozer		46.1	42.1	N/A	N/A	N/A	N/A	N/A
Dozer		46.1	42.1	N/A	N/A	N/A	N/A	N/A
Tractor		48.4	44.5	N/A	N/A	N/A	N/A	N/A
	Total	49.4	50.6	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018
Case Description: Desert Hot Springs_Install

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2000	0
Crane	No	16		80.6	2000	0
Crane	No	16		80.6	2000	0
Crane	No	16		80.6	2000	0
Man Lift	No	20		74.7	2000	0
Man Lift	No	20		74.7	2000	0
Roller	No	20		80	2000	0
Dozer	No	40		81.7	2000	0
Slurry Trenching Machine	No	50		80.4	2000	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Man Lift		42.7	35.7	N/A	N/A	N/A	N/A	N/A
Man Lift		42.7	35.7	N/A	N/A	N/A	N/A	N/A
Roller		48	41	N/A	N/A	N/A	N/A	N/A
Dozer		49.6	45.6	N/A	N/A	N/A	N/A	N/A
Slurry Trenching Machine		48.3	45.3	N/A	N/A	N/A	N/A	N/A
	Total	49.6	51.3	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	3000	0
Crane	No	16		80.6	3000	0
Crane	No	16		80.6	3000	0
Crane	No	16		80.6	3000	0

Man Lift	No	20		74.7	3000	0
Man Lift	No	20		74.7	3000	0
Roller	No	20		80	3000	0
Dozer	No	40		81.7	3000	0
Slurry Trenching Machine	No	50		80.4	3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Man Lift		39.1	32.1	N/A	N/A	N/A	N/A	N/A
Man Lift		39.1	32.1	N/A	N/A	N/A	N/A	N/A
Roller		44.4	37.4	N/A	N/A	N/A	N/A	N/A
Dozer		46.1	42.1	N/A	N/A	N/A	N/A	N/A
Slurry Trenching Machine		44.8	41.8	N/A	N/A	N/A	N/A	N/A
	Total	46.1	47.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018
Case Description: Desert Hot Springs_Mobilization/Laydown

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Man Lift	No	20		74.7	2000	0
Grader	No	40	85		2000	0
Roller	No	20		80	2000	0
Dozer	No	40		81.7	2000	0
Dozer	No	40		81.7	2000	0
Tractor	No	40	84		2000	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax

Man Lift		42.7	35.7	N/A	N/A	N/A	N/A	N/A
Grader		53	49	N/A	N/A	N/A	N/A	N/A
Roller		48	41	N/A	N/A	N/A	N/A	N/A
Dozer		49.6	45.6	N/A	N/A	N/A	N/A	N/A
Dozer		49.6	45.6	N/A	N/A	N/A	N/A	N/A
Tractor		52	48	N/A	N/A	N/A	N/A	N/A
	Total	53	53.6	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	3000	0
Grader	No	40	85		3000	0
Roller	No	20		80	3000	0
Dozer	No	40		81.7	3000	0
Dozer	No	40		81.7	3000	0
Tractor	No	40	84		3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		39.1	32.1	N/A	N/A	N/A	N/A	N/A
Grader		49.4	45.5	N/A	N/A	N/A	N/A	N/A
Roller		44.4	37.4	N/A	N/A	N/A	N/A	N/A
Dozer		46.1	42.1	N/A	N/A	N/A	N/A	N/A
Dozer		46.1	42.1	N/A	N/A	N/A	N/A	N/A
Tractor		48.4	44.5	N/A	N/A	N/A	N/A	N/A
	Total	49.4	50.1	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018
Case Description: Desert Hot Springs_Roads

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

Description		Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift		No	20		74.7	2000	0
Grader		No	40	85		2000	0
Roller		No	20		80	2000	0
Dozer		No	40		81.7	2000	0
Tractor		No	40	84		2000	0
Front End Loader		No	40		79.1	2000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		42.7	35.7	N/A	N/A	N/A	N/A	N/A
Grader		53	49	N/A	N/A	N/A	N/A	N/A
Roller		48	41	N/A	N/A	N/A	N/A	N/A
Dozer		49.6	45.6	N/A	N/A	N/A	N/A	N/A
Tractor		52	48	N/A	N/A	N/A	N/A	N/A
Front End Loader		47.1	43.1	N/A	N/A	N/A	N/A	N/A
	Total	53	53.3	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

Description		Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift		No	20		74.7	3000	0
Grader		No	40	85		3000	0
Roller		No	20		80	3000	0
Dozer		No	40		81.7	3000	0
Tractor		No	40	84		3000	0
Front End Loader		No	40		79.1	3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		39.1	32.1	N/A	N/A	N/A	N/A	N/A
Grader		49.4	45.5	N/A	N/A	N/A	N/A	N/A

Roller		44.4	37.4	N/A	N/A	N/A	N/A	N/A
Dozer		46.1	42.1	N/A	N/A	N/A	N/A	N/A
Tractor		48.4	44.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		43.5	39.6	N/A	N/A	N/A	N/A	N/A
	Total	49.4	49.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018

Case Description: Desert Hot Springs_ Site Prep/Grading

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Man Lift	No	20		74.7	2000	0
Grader	No	40	85		2000	0
Roller	No	20		80	2000	0
Dozer	No	40		81.7	2000	0
Tractor	No	40	84		2000	0
Front End Loader	No	40		79.1	2000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		42.7	35.7	N/A	N/A	N/A	N/A	N/A
Grader		53	49	N/A	N/A	N/A	N/A	N/A
Roller		48	41	N/A	N/A	N/A	N/A	N/A
Dozer		49.6	45.6	N/A	N/A	N/A	N/A	N/A
Tractor		52	48	N/A	N/A	N/A	N/A	N/A
Front End Loader		47.1	43.1	N/A	N/A	N/A	N/A	N/A
	Total	53	53.3	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	3000	0
Grader	No	40	85		3000	0
Roller	No	20		80	3000	0
Dozer	No	40		81.7	3000	0
Tractor	No	40	84		3000	0
Front End Loader	No	40		79.1	3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Man Lift		39.1	32.1	N/A	N/A	N/A	N/A	N/A
Grader		49.4	45.5	N/A	N/A	N/A	N/A	N/A
Roller		44.4	37.4	N/A	N/A	N/A	N/A	N/A
Dozer		46.1	42.1	N/A	N/A	N/A	N/A	N/A
Tractor		48.4	44.5	N/A	N/A	N/A	N/A	N/A
Front End Loader		43.5	39.6	N/A	N/A	N/A	N/A	N/A
	Total	49.4	49.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018

Case Description: Desert Hot Springs_Turbine Decommisioning - 1

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2000	0
Compressor (air)	No	40		77.7	2000	0
Crane	No	16		80.6	2000	0
Generator	No	50		80.6	2000	0
Generator	No	50		80.6	2000	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax

Compressor (air)		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Compressor (air)		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Generator		48.6	45.6	N/A	N/A	N/A	N/A	N/A
Generator		48.6	45.6	N/A	N/A	N/A	N/A	N/A
	Total	48.6	50.5	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	3000	0
Compressor (air)	No	40		77.7	3000	0
Crane	No	16		80.6	3000	0
Generator	No	50		80.6	3000	0
Generator	No	50		80.6	3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		42.1	38.1	N/A	N/A	N/A	N/A	N/A
Compressor (air)		42.1	38.1	N/A	N/A	N/A	N/A	N/A
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Generator		45.1	42.1	N/A	N/A	N/A	N/A	N/A
Generator		45.1	42.1	N/A	N/A	N/A	N/A	N/A
	Total	45.1	47	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/28/2018
Case Description: Desert Hot Springs_Turbine Decommissioning - 2

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Nearest Receiver 2000'	Residential	65	60	55

			Equipment			
			Spec	Actual	Receptor	Estimated

Description	Impact Device	Usage(%)	Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Compressor (air)	No	40		77.7	2000	0
Compressor (air)	No	40	80		2000	0
Crane	No	16		80.6	2000	0
Generator	No	50		80.6	2000	0
Generator	No	50		80.6	2000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		45.6	41.6	N/A	N/A	N/A	N/A	N/A
Compressor (air)		48	44	N/A	N/A	N/A	N/A	N/A
Crane		48.5	40.6	N/A	N/A	N/A	N/A	N/A
Generator		48.6	45.6	N/A	N/A	N/A	N/A	N/A
Generator		48.6	45.6	N/A	N/A	N/A	N/A	N/A
	Total	48.6	50.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Typical Receiver 3000'	Residential	65	60	55

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	3000	0
Compressor (air)	No	40	80		3000	0
Crane	No	16		80.6	3000	0
Generator	No	50		80.6	3000	0
Generator	No	50		80.6	3000	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Compressor (air)		42.1	38.1	N/A	N/A	N/A	N/A	N/A
Compressor (air)		44.4	40.5	N/A	N/A	N/A	N/A	N/A
Crane		45	37	N/A	N/A	N/A	N/A	N/A
Generator		45.1	42.1	N/A	N/A	N/A	N/A	N/A
Generator		45.1	42.1	N/A	N/A	N/A	N/A	N/A
	Total	45.1	47.4	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

ATTACHMENT D

Resume

Mike Greene, INCE Bd. Cert.

Environmental Specialist/Acoustician

EDUCATION

University of California, San Diego
BS, Applied Mechanics, 1985

CERTIFICATIONS

Board Certified, Institute of Noise Control Engineering (INCE Bd. Cert.)

County of San Diego-Approved

PROFESSIONAL AFFILIATIONS

Transportation Research Board, ADC40 Subcommittee

Mike Greene is an environmental specialist/acoustician with more than 26 years' professional experience in acoustical analysis and noise control engineering. He has conducted and participated in noise and vibration analyses for hundreds of transportation, commercial, industrial, and residential developments throughout California and the United States.

Mr. Greene has conducted noise studies for industrial and commercial facilities, ranging from power generation projects to hospitals and super-speedway facilities. He is experienced in the modeling of existing and future roadway noise impacts using the Federal Highway Administration's (FHWA) Traffic Noise Model (TNM®) and with the use of both SoundPLAN and CadnaA, computer software programs for prediction and assessment of noise levels near industrial facilities and other noise sources such as roadways, railways, and airports.

Project Experience

Development

Rosemary's Mountain Quarry, Granite Construction, San Diego County, California. In support of ongoing quarry operations and as a condition of approval, Dudek has conducted ongoing quarterly (now semi-annual) noise monitoring services at this sand and gravel mine located in northeast San Diego County for the past five years. Conducted noise measurements using a sound level meter classified as Type I by the American National Standards Institute (ANSI) and in accordance with ANSI protocol for community noise measurements. Using noise measurement data collected by Dudek staff, prepared summary noise monitoring reports documenting the measured noise levels and the quarry operations' compliance with applicable County of San Diego noise standards. Carried out supplemental as-needed services relating to quarry operations (i.e., nighttime asphalt plant measurements, or blasting noise measurements as requested by quarry operator staff and/or County of San Diego compliance staff. Previously conducted noise studies and written noise reports for proposed conditional use permit modifications for Rosemary's Mountain Quarry to ensure continued compliance with County noise standards and permit conditions.

Corporate Yard Facility Project, City of Pomona, California. As a component of the project's technical analyses and the environmental document, conducted a noise study of potential impacts during construction and operations to noise-sensitive land uses (residences) adjacent to the proposed project. Characterized the existing ambient noise environment using noise measurements on site and at representative noise-sensitive receiver locations surrounding the project site. Conducted noise measurements using a sound level meter classified as Type I or Type II by the ANSI and in accordance with ANSI protocol for community noise measurements. Evaluated short-term construction noise impacts on nearby noise-sensitive land uses based on construction equipment data provided by the project applicant and the FHWA Roadway Construction Noise Model (RCNM). Evaluated long-term (operational) noise effects from the existing, future and project-related vehicle trips along the nearby arterial roadways using the volumes from the project's traffic study and the FHWA's TNM version 2.5. Also evaluated on-site operational noise from heating, ventilation, and air conditioning (HVAC) equipment, shop/service bay noise or other noise-generating project features. Assessed the significance of noise impacts based on City of Pomona noise standards. Recommended mitigation measures to reduce impacts to a less than significant level from construction noise. Summarized the environmental noise baseline and regulatory setting, analysis methodologies, results of the noise analysis, findings of potential effects and mitigation measures in the noise section of the project's environmental document.

Sunroad East Harbor Island Hotel Draft Environmental Impact Report (EIR) and Port Master Plan Amendment, Port of San Diego, California. Served as task manager to conduct a noise analysis that included noise measurements, on- and off-site traffic and construction noise impact assessment, in addition to other on-site operational noises, such as HVAC, parking lots, etc., and effects from nearby San Diego International Airport. The results of the analysis were summarized in a technical report and in the noise section of the EIR.

Rider Distribution Warehouse Technical Studies and EIR, Aiere Property Group, Riverside County, California. Responsible for noise measurement, analysis, and reporting of potential effects on the noise environment from the project. Construction noise (which included potential rock blasting) and operational noise from warehouse and truck operations were addressed for this project which was located near a nature preserve area and residences.

Tejon Mountain Village EIR, Tejon Ranch Company, Tejon, California. Conducted the noise analysis for the EIR for Tejon Mountain Village, a proposed resort community located near the Grapevine in northern Los Angeles County. Noise measurements of existing ambient noise levels were conducted in the vicinity of the Interstate 5 (I-5) freeway as well as in the more remote portions of the project site. Traffic noise was modeled using the TNM® noise model. Additionally, potential for noise impacts from a distant sand and gravel mine was assessed, as well as from construction noise of the project itself.

Coronado Yacht Club Redevelopment and Expansion EIR, Port of San Diego, California. Served as noise task manager to provide guidance and oversight of the noise analysis and reporting of results for the proposed improvements to the Coronado Yacht Club.

San Diego Convention Center EIR, Port of San Diego, California. Served as noise task manager to provide guidance and oversight of the noise analysis and reporting of results for the proposed expansion of the San Diego Convention Center. Issues included potential noise effects from construction activities as well as proposed outdoor events overlooking the harbor and Coronado Island residents.

San Pedro Waterfront Environmental Impact Statement (EIS)/EIR, Port of Los Angeles, California. As noise task manager, was responsible for the successful completion of the noise analysis. Managed and supervised the noise measurements, modeling, analysis and results reporting. Primary issues of concern included potential effects from traffic and construction noise.

Wilmington Waterfront EIR, Port of Los Angeles, California. Responsible for the successful completion of the noise analysis for this complex project. Conducted and supervised the noise measurements, modeling, analysis and results reporting, which involved analysis of potential effects from traffic, freight rail, light rail, industrial and construction noise.

Education

Fullerton College Master Plan Program EIR, North Orange County Community College District, California. Prepared Noise analysis for the Facilities Master Plan Program EIR. Issues include historic building preservation, traffic, and parking, and adjacent neighbor concerns associated with noise, traffic, parking, and growth inducement. The project is going to the Board of Trustees for consideration of certification of the Program EIR and approval of the Master Plan on December 12, 2017.

Mary Fay Pendleton School, Roesling Nakamura Terada Architects Inc., Fallbrook, California. Served as task manager for noise and vibration analysis. Project involved substantial demolition and construction work on the site of an existing elementary school within the Marine Corps Base Camp Pendleton property. Project site had nearby residences, for which potential impacts from noise and vibration were a concern. Conducted ambient field noise measurements to document the existing baseline noise levels in the project vicinity. Estimated construction noise impacts using the FHWA RCNM, and construction vibration levels at nearby residences were estimated using methodology recommended by the Federal Transit Administration (FTA). Resulting noise/vibration levels were compared to the relevant standards. The results of the noise analysis were summarized in the noise section of the project's environmental document.

San Onofre School Renovation, Roesling Nakamura Terada Architects Inc., Fallbrook, California. Served as task manager for noise and vibration analysis. Project involved substantial demolition and construction work on the site of an existing elementary school within the Marine Corps Base Camp Pendleton property. Project site had nearby residences, for which potential impacts from noise and vibration were a concern. Ambient field noise measurements were conducted to document the existing baseline noise levels in the project vicinity. Construction noise impacts were estimated using the FHWA RCNM, and construction vibration levels at nearby residences were estimated using methodology recommended by the FTA. Resulting noise/vibration levels were compared to the relevant standards. The results of the noise analysis were summarized in the noise section of the project's environmental document.

EIR for Campus Master Plan and Student Housing, California State University, Dominguez Hills, Carson, California. Responsible for the completion of the noise analysis and reporting for the project. Supervised the noise measurements, modeling, analysis and results reporting, which involved analysis of potential effects from traffic, on-campus facilities, and operations and construction noise.

Multiple School Projects, Los Angeles Unified School District, California. Noise analyses were conducted for several proposed school construction projects as part of an on-call environmental consulting contract for the district. Noise studies were conducted for L.A. Unified School District High Schools 13, 9, and 12. The analyses included noise measurements of ambient conditions and traffic noise impact analysis to estimate potential noise effects at both existing noise-sensitive land uses and proposed on-site receptors. Additionally, noise during construction and operation (such as from school athletic fields and stadiums) was assessed. The results of the noise studies were summarized in noise technical reports.

Energy

Haynes Generating Station Units 3–6 Demolition Project, Los Angeles Department of Water and Power (LADWP), Long Beach, California. The LADWP proposes to remove the existing Haynes Generating Station electrical generation Units 3–6 from the Haynes facility site, making space for a potential future repowering project. The proposed project would include the demolition of the units and ancillary facilities. Dudek is preparing the noise analysis of potential noise and vibration impacts during the demolition process, which is anticipated to be a 4-year endeavor.

Scattergood Generating Station Project, LADWP, El Segundo, California. Preparing the noise section of the EIR for the final phase of the ongoing repower project**.** In conjunction with this work, Dudek has also been providing direct support to LADWP staff in evaluating and conducting noise measurements of the current noise environment, specifically relating to the recent installation of several new units and any resultant noise increase in the noise levels at adjacent noise-sensitive land uses.

El Segundo Power Redevelopment Project, NRG/Dynegy, El Segundo, California. Conducted the noise analysis for a proposed 630-megawatt power plant. Project would replace two aging power units with a newer, more efficient combined-cycle (combustion turbines and steam turbine) plant. Responsible for the preparation of the noise analysis, a section of the project's Application for Certification, response to comments, and oral and written testimony before the California Energy Commission.

Weymouth Filtration Plant Solar Project, Metropolitan Water District of Southern California (MWD), La Verne, California. Conducted the noise study for the Initial Study (IS)/Mitigated Negative Declaration (MND) for this project. The primary issue with respect to noise from the project was potential effects at nearby residences and other land uses from construction activities associated with the proposed project.

Lake Skinner Solar Project, MWD, Riverside County, California. Conducted the noise study for the IS/MND for this project, located in Riverside County. The primary issue with respect to noise was potential effects at adjacent residences from construction activities associated with the proposed project.

OceanWay Secure Energy Project EIS/EIR for Woodside Natural Gas Deepwater Port, Amec Foster Wheeler, Los Angeles County, California. Responsible for the noise and vibration section of the EIS/EIR of this proposed liquefied natural gas project. The potential noise/vibration effects of onshore construction and operations were assessed with respect to local, state and federal standards.

Transportation

Meadowpass Road Extension EIR, City of Walnut, California. Responsible for the measurement, analysis, and reporting. The primary issue for this project with respect to noise was potential effects from traffic at nearby residences as a result of the construction of the road extension.

I-15 Widening from San Bernardino to I-215 EIR/EIS, Transportation Commission, County of Riverside, California. Potential noise increases at adjacent noise-sensitive land uses were addressed pursuant to the FHWA and California Department of Transportation (Caltrans) guidelines. Noise measurements were conducted at representative noise-sensitive land uses along the 43.5-mile project alignment. Noise modeling (TNM® Version 2.5) was conducted in order to assess the changes in future traffic noise levels resulting from the proposed improvements, to determine existing and future traffic noise impacts and to provide noise abatement design guidance as needed. The results of the noise study were summarized in a noise study report and noise abatement decision report pursuant to Caltrans Technical Noise Supplement (TeNS) and noise protocol guidance.

State Route 2 (SR-2) Freeway Terminus IS/Environmental Assessment, Metro, Los Angeles, California. As part of this joint National Environmental Policy Act/California Environmental Quality Act (CEQA) document, the project was analyzed at an equal level of detail for the No Action alternative and all five project alternatives. The analyses were conducted in accordance with guidelines set forth in the Caltrans Traffic Noise Protocol and TeNS handbooks. The study included noise measurements of ambient conditions adjacent to the project alignment, traffic noise impact analysis (using TNM® Version 2.5) to estimate potential noise effects at existing noise-sensitive receptors, and noise during construction. Results were summarized in a noise study report pursuant to Caltrans TeNS guidance.

Northern Canoga Extension of the Orange Line EIR, Metro, Reseda, California. Project entailed noise measurements and subsequent noise analysis of Metro bus operations on rubberized asphalt concrete (RAC) and non-RAC busway pavement to determine the benefit provided by RAC. Because differences in the noise levels were not expected to be substantial and because of site conditions, the design of the measurement setups was crucial. Site selection and details of the measurement procedures, including coordination of a dedicated test bus and driver, was an important part of the study. Simultaneous measurements at multiple locations were conducted from approximately 1 a.m. to 4 a.m. to reduce the influence of background noise. Noise measurement methodology, analysis results, and conclusions were summarized in a technical memorandum to the client.

Busway and Bus Rapid Transit Projects, Massachusetts Bay Transportation Authority, Boston, Massachusetts. Conducted and participated in noise analyses for Busway and Bus-Rapid Transit (BRT) projects using FTA methodologies and standards. The project involved the construction of a proposed BRT project in downtown Boston. Analyzed potential noise and vibration impacts at adjacent sensitive receptors from construction and operation using FTA methodologies. In addition, worked on similar projects in Portland, Oregon, and near Dallas, Texas.

Water/Wastewater

Anaheim South Recycled Water Project, City of Anaheim, California. Working with Dudek's Engineering project team, prepared a technical memorandum summarizing the analysis of construction and operations noise from the proposed Anaheim South Recycled Water Project. The project will install the recycled water supply and metering connection, pump station, and distribution pipelines serving the southern resort area of Anaheim. Dudek acoustical specialists evaluated the noise and vibration impacts, as specified in Appendix G (Environmental Checklist) of the CEQA IS form associated with the proposed project.

Operations and Maintenance EIRs, MWD, San Bernardino County, California. As part of the EIR for the Western San Bernardino County Distribution System Infrastructure Protection Program, Dudek's acoustical specialists prepared the noise and vibration impacts analysis and EIR noise section. The analysis documented the existing noise setting through a series of noise measurements at representative locations near the project alignments, identified associated regulatory requirements, evaluated potential impacts associated with noise that would result from the proposed program, and identified mitigation measures to reduce the level of significance for impacts associated with implementation of the proposed program.

New Evans Reservoir IS/MND, City of Riverside Public Utilities Department, California. Responsible for the measurement, analysis, and reporting of noise for this IS/MND. The primary issue for this project with respect to noise was construction (trenching) along the pipeline alignment adjacent to noise-sensitive land receptors.

Recycled Water System Capital Improvement Project EIR, Otay Water District, Otay Mesa, California. Responsible for the noise analysis for this ongoing project involving the construction of three recycled water pipelines by the Otay Water District. The potential effect of noise from construction activities was the primary issue with regard to noise for this project. Noise levels at adjacent noise-sensitive uses were predicted and compared with relevant thresholds of significance, and mitigation measures were recommended as necessary to reduce noise to a level below significance.

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