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APPLICANT'S SUPPLEMENTAL RESPONSE TO DATA REQUEST 16 AND 26: ADDITIONAL INFORMATION REGARDING NOISE

In this section of Applicant's Supplemental Response to CEC Staff Data Requests 16 and 26, Applicant describes the changes to the Noise section that will result from the changes to the Project Description relating to the removal of Unit 3 and the new schedule of operating equipment associated with the boiler optimization. Per staff's request, Applicant uses a strike-out/underline format to identify changes to the Noise section of the Application for Certification that will result from the changes to the Project Description.

The Noise-sub-sections that have been modified are listed in the table of contents below. If there has been no change to a Noise sub-section relating to Applicant's Supplemental Response to Data Request 16 and 26, the section is labeled "no changes" in the table of contents below.

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5.7 NOISE

5.7.1 Introduction (see Section 2.1.1 for updated project description)

5.7.2 Laws, Ordinances, Regulations, and Standards (no changes)

5.7.3 Fundamentals of Sound and Noise (no changes)

5.7.4 Affected Environment (no changes)

5.7.4.1 Noise Sensitive Receptors (no changes)

5.7.4.2 Sound Level Measurements

To determine ambient sound levels at representative receptors, four long-term (LT) measurements and two short-term (ST) measurements were conducted using laboratory-calibrated American National Standards Institute (ANSI) Type 1 and Type 2 sound level meters (SLM). ST measurements are, for purposes of this study, one continuous hour in duration. LT measurements have continuous durations of at least 25 sequential hours. Each LT SLM was placed in a weatherproof environmental case, with an external microphone (connected via cable to the SLM within the case) positioned approximately four feet above the ground. Each ST SLM, with its directly-attached microphone, was placed on a tripod approximately five feet above the ground. Each SLM was equipped with a field-appropriate 3.5-inch diameter windscreen for its microphone and set for slow time-response and A-weighting. Each SLM was field-calibrated before and after each measurement period with an acoustic field calibrator. All sound level measurements were conducted in a practical manner that reflected accordance with (or consideration of) applicable portions of International Organization for Standardization (ISO) 1996-1, 2 and part 3 standards.

Weather conditions during the survey period were generally hot with clear sky and no precipitation. The air temperature ranged from 88 degrees Fahrenheit (°F) at night to 108°F during the day, with approximately forty percent relative humidity. When observed and measured with a hand-held anemometer, winds were calm during the daytime hours and ranging from zero to 12 miles per hour (mph) average speed from the south during the nighttime hours. Observed weather conditions during the measurement periods were considered seasonally appropriate and thus representative of the area.

Tables 5.7-3 and 5.7-4 present summaries of the LT and ST SPL measurements, respectively. Values presented are for the entire 25-hour measurement period. See Appendix 5.7A for further details. Field Noise Measurement Data Forms containing detailed information for each of the measurement locations are included in Appendix 5.7B. Appendix 5.7A contains detailed sound metrics and statistical information for each sequential one hour portion of each LT measurement. The measurement locations are described as follows:

- **LT1** was located at northwestern corner of Palo Verde Road and Spencer Road. There were a few mobile homes in this area, clustered with some non-residential and unoccupied structures. This location is ~~approximately 7,500 feet to the closest project boundary,~~ approximately 8,~~200~~ 700 feet to the closest Project heliostat and 13,770 feet to the closest power block (Rio Mesa I). Three LT measurements were conducted in this area as follows:

- *LT1**a*** was placed at the western end of this area (closest to the Project);
- *LT1**b*** was placed by the mobile home at the northern end of this area; and,
- *LT1**c*** was placed at the eastern end of this area.

Due to the proximity of occupied mobile homes at LT1a and LT1b, the measurements were affected by air conditioning operation sound. LT1c was placed approximately 200 feet east of the nearest mobile home, in an attempt to measure ambient sound with reduced influence from this seasonally operating equipment sound source (i.e., by relying on sound attenuation due to geometric divergence).

- **LT2** was placed in the open space at the southeastern corner of 32nd Avenue and State Route 78, where State Route 78 changes direction. The SLM was located approximately 125 feet east of State Route 78 and 230 feet south of 32nd Avenue. This location is ~~approximately 5,700 feet to the closet project boundary,~~ approximately 9,180 feet to the closest project heliostat and ~~13,120~~ 18,040 feet to the closest power block (Rio Mesa ~~I~~II). The dominant sound source was vehicular traffic on State Route 78. Other sound sources include rustling leaves and vocalizing birds. Note that the SLM was located in a privately-owned open space to safely conduct measurement of the State Route 78 traffic-dominated representative ambient sound environment for multiple nearby occupied residences.
- **ST1** was placed in the town of Palo Verde in Imperial County. The SLM was located north of the residential property at the southeastern corner of 3rd Street and Alley Way. It was approximately 40 feet from Alley Way and 200 feet from State Route 78. This location is ~~approximately 9,900 feet to the closest project boundary,~~ approximately 10,720 feet to the closest project heliostat and 16,400 feet to the closest power block (Rio Mesa I). The dominant sound source was vehicular traffic on State Route 78. Other sound sources include dogs barking, birds vocalizing, and leavess rustling.
- **ST2** was placed north of the mobile home located at the southwestern corner of 35th Avenue and State Route 78 in Riverside County. The SLM was approximately 125 feet from State Route 78. This location is ~~approximately 5,700 feet to the closest project boundary,~~ approximately 9,840 feet to the closest project heliostat and 15,250 feet to the closest power block (Rio Mesa I). The dominant sound source was vehicular traffic on State Route 78. Other sound sources included occasional traffic on 35th Avenue and rustling leaves.

Table 5.7-3
Summary of Long-Term Measurements (dBA) (no changes)

Table 5.7-4
Summary of Short-Term Measurements (dBA) (no changes)

Comparison of sound metrics and statistics among measurement locations LT1a, LT1b and LT1c demonstrate that considerable variance in decibel levels can occur and is apparently due to factors such as proximity of continuous sound sources like the aforementioned air conditioning units. One key difference between the set of LT1 measurement positions and that for LT2, ST1 and ST2 is that the former is over a half mile away from vehicular traffic on State Route 78, an apparent dominant contributor to ambient sound at the latter.

5.7.5 Environmental Analysis (no changes)

5.7.5.1 Construction Noise

Prediction Methodology

Construction of the Project is expected to be similar to other power plants in terms of schedule, equipment used, and related activities. A centralized power block of electro-mechanical systems and high-pressure fluid-handling equipment associated with a typical steam turbine generator will be installed at each of the ~~three~~ two plants. The overall noise level will vary during the construction period, depending upon the phasing and concurrence of different construction activities and their general locations or zones of the project area.

The Empire State Electric Energy Research Company (ESERC) extensively studied noise from individual pieces of construction equipment as well as from construction sites of power plants and other types of facilities (Bolt Beranek & Newman, Inc., 1977). In general, the construction of power plants can be divided into five phases that use different types of construction equipment: site preparation, concrete pouring, steel erection, mechanical, and site clean-up.

More recently, the Federal Highway Administration (FHWA) released its Roadway Construction Noise Model (RCNM), which contains empirically determined reference sound level data for a large variety of equipment types (FHWA, 2006).

Since specific information on types, quantities, and operating schedules of equipment expected for Project construction is not available at this point in the project development, information from these aforementioned reference documents for similarly sized industrial projects will be used to estimate construction noise associated with this Project.

Consistent with the approach adopted by the BLM (2005), construction noise can reasonably be estimated from the two loudest equipment types generally operating at a site. As these types may differ depending on the phase of construction, Table 5.7-5 below presents the Applicant's anticipated loudest two types of equipment for each distinct phase of construction activity. Also, shown separately is the line for a vibratory pile driver, which is expected to be the main method of installing numerous posts (i.e., not concrete pads) across the project site onto which heliostat hardware will be installed. The composite site noise level represents the logarithmic sum of the indicated equipment, adjusted by acoustical usage factor (i.e., the percentage of time during which the equipment is actually operating and thus producing sound). For purposes of predictive analysis conservatism, three dBA is then algebraically added to this result.

Table 5.7-5
Typical Construction Phases and Composite Noise Levels Expected for Project (no changes)

The difference between the composite site noise level at 50 feet and a level at some greater distance away is due largely to naturally occurring sound attenuation as noise propagates away from a source (a.k.a., geometric divergence, or the "six dB per doubling" rule of thumb). Added to this attenuation from geometric divergence, and although affected by temperature and humidity, atmospheric acoustical absorption offers attenuation at a rate of about one dBA per thousand feet of horizontal distance that a sound travels. Conservatively, attenuation from linearly-occluding terrain and acoustical absorption from ground effects (i.e., porous soils or dense vegetative cover) is ignored.

As the Project includes power blocks, surrounding arrays of heliostats, and a temporary concrete batch plant ~~sites within~~residing within the project boundary, predicted construction noise is evaluated at a noise-sensitive receptor from generalized aggregate sound sources having "acoustic centers" as follows:

- The geographic central point of each power block (where Site Clearing and Excavation would be the loudest of the five construction phases to occur here);
- The geographic central point of ~~each~~ the concrete batch area (where Concrete Batch Plant would be sourced); and,
- A project ~~property boundary~~ location nearest to the receptor at which heliostats are to be installed.

Note that construction is expected to occur 24 hours a day, 7 days a week, particularly during the summer when high daytime temperatures will require night-time concrete pours and other activities.

Steam blows could occur during the construction period. However, steam blow activity will be infrequent. Other project construction includes erection of permanent facilities (e.g., structures) at the common area that are located at the eastern project boundary. For purposes of this analysis, construction activity here is assumed to be located at the nearest project heliostat and generate noise not louder than the vibratory pile driving activity. Likewise, construction of the new gen-tie line is not anticipated to involve activities or equipment that are louder than vibratory pile driving.

With these conditions in mind, anticipated construction noise that might be measured at representative noise-sensitive receptors can be estimated for reasonable worst cases and are presented below.

Estimated Construction Noise at the Representative NSRs

Using the methodology described in Section 5.7.5.1, Table 5.7-6 presents the distances from each receptor to construction activities and Table 5.7-7 presents the estimated construction noise levels for each construction activity at the representative noise-sensitive receptors under consideration. Aggregate construction noise levels in Table 5.7-7 represent the estimated logarithmic sum of sound from all six identified individual construction activities.

Table 5.7-6
Distance between Noise Sensitive Receptors and Each Construction Activity Site (feet)

Receptor	Closest Heliostat post installation	Rio Mesa I Power Block	Rio Mesa II Power Block	~~Rio Mesa III Power Block~~	Concrete Batch Plant ~~Units 1&2~~	~~Concrete Batch Plant Unit 3~~
LT1	8,~~200~~700	13,770	20,130	~~23,810~~	17,000	~~19,200~~
LT2	9,180	18,040	19,680	~~13,120~~	14,710	~~11,460~~
ST1	10,720	16,400	22,460	~~24,860~~	18,800	~~20,360~~
ST2	9,840	15,250	19,250	~~17,610~~	14,600	~~13,900~~

LT = Long Term

ST = Short Term

Table 5.7-7
Estimated Construction Noise at Representative Noise Sensitive Receptors
(average hourly Leq in dBA)

Receptor	Closest ~~Project Boundary~~Heliostat Installation	Rio Mesa I Power Block	Rio Mesa II Power Block	~~Rio Mesa III Power Block~~	Concrete Batch Plant ~~Units 1&2~~	~~Concrete Batch Plant Unit 3~~	Aggregate Construction Noise Level
LT1	~~39~~37	24	<20	~~<20~~	<20	~~<20~~	~~39~~38
LT2	37	<20	<20	~~26~~	<20	~~22~~	37
ST1	34	<20	<20	~~<20~~	<20	~~<20~~	34
ST2	35	~~<20~~22	<20	~~<20~~	<20	~~21~~	~~35~~36

Leq = Equivalent Sound Level
LT = Long Term
ST = Short Term

Table 5.7-6 reveals that the distance between all identified construction activities and the sensitive receptors are much greater than a quarter mile; therefore, noise from the construction activities is exempt from Riverside County Ordinance 824 limits and correspondingly not considered an impact.

With respect to CEC siting guidelines, the comparison of estimated aggregate construction noise levels from Table 5.7-7 with existing ambient sound levels are shown in Tables 5.7-8 and 5.7-9.

Table 5.7-8
Comparison of Aggregate Daytime Construction Noise with Existing Daytime Ambient at Representative Noise-Sensitive Receptors

Noise-Sensitive Receptor Identification	Existing Ambient (hourly Leq, dBA) [1]	Project as Designed		
		Loudest Aggregate Construction Noise (ACN) [2] (hourly Leq, dBA)	Existing + ACN [3] (Leq, dBA)	Increase Over Existing (Leq, dBA)
LT1a	41	~~39~~38	43	2
LT1b	46	~~39~~38	47	1
LT1c	35	~~38~~39	~~40~~39	~~5~~4
LT2	53	37	53	0
ST1	46	34	46	0
ST2	59	36~~5~~	59	0

[1] Quieter measured daytime hour (for ST1 and ST2), or algebraic average of 4 quietest daytime (7 a.m. to 10 p.m.) hours at LTs.
[2] Loudest level ~~among~~ between the ~~three~~ two solar power towers under construction, from Table 5.7-7.
[3] This is a logarithmic sum of Existing and Calculated, not algebraic.
Leq = Equivalent Sound Level
dBA = A-weighted decibel
LT = Long Term
ST = Short Term
ACN = Aggregate Construction Noise

Because all increases over existing daytime ambient sound are anticipated to be ~~five~~ four dBA or less, daytime aggregate construction noise is expected to be less than significant.

Table 5.7-9
Comparison of Aggregate Nighttime Construction Noise with Existing Nighttime Ambient at Representative Noise-Sensitive Receptors

Noise-Sensitive Receptor Identification	Existing Ambient (hourly Leq, dBA) [1]	Project as Designed		
		Loudest Aggregate Construction Noise (ACN) [2] (hourly Leq, dBA)	Existing + ACN [3] (Leq, dBA)	Increase Over Existing (Leq, dBA)
LT1a	46	38~~9~~	47	1
LT1b	40	38~~9~~	42~~3~~	2~~3~~
LT1c	34	38~~9~~	39~~40~~	5~~6~~
LT2	48	37	48	0
ST1	40	34	41	1
ST2	54	36~~5~~	54	0

[1]Measured nighttime hour (for ST1 and ST2), or algebraic average of 4 quietest nighttime (10 p.m. to 7 a.m.) hours at LTs.

[2] Loudest level ~~among~~ between the ~~three~~ two solar power towers under construction, from Table 5.7-7.

[3] This is a logarithmic sum of Existing and Calculated, not algebraic.

Leq = Equivalent Sound Level   LT = Long Term   ACN = Aggregate Construction Noise
dBA = A-weighted decibel   ST = Short Term

Because all increases over existing nighttime ambient sound are anticipated to be ~~six~~ five dBA or less, nighttime aggregate construction noise is expected to be less than significant.

Piping Steam Blows

One of the loudest, but temporary, proposed construction activities will likely be the steam blows required to prepare the SRSG, steam turbine, and associated piping for startup during the final construction phase before operation. This process cleans the piping and tubing which carry steam to the turbines; starting the turbines without cleaning these systems can damage the turbine. Either a series of high-pressure bursts (lasting no more than a few minutes duration each), or a continuous low-pressure technique can be used for steam blows. The noise level of un-muffled high-pressure bursts is estimated to result in 125 dBA at 50 feet (Bolt Beranek and Newman Inc., 1997) Table 5.7-10 presents estimated steam blow noise, sourced at the power blocks (i.e., where the piping is located), at the representative noise-sensitive receptors.

Table 5.7-10
Comparison of Un-muffled high pressure Steam Blow Noise with Existing Daytime Ambient at Representative Noise Sensitive Receptors

Noise-Sensitive Receptor Identification	Existing Ambient (Leq, dBA) 1	Project as Designed		
		High-pressure Steam Blow Noise (HSBN) 2 (hourly Leq, dBA)	Existing + ACN HSBN 3 (Leq, dBA)	Increase Over Existing (Leq, dBA)
LT1a	41	636	636	225
LT1b	46	636	636	1720
LT1c	35	636	636	2831
LT2	53	5865	5965	612
ST1	46	5964	5964	138
ST2	59	6167	637	48

1 Quieter measured daytime hour (for ST1 and ST2), or algebraic average of 4 quietest daytime (7 a.m. to 10 p.m.) hours at LTs.
2 Sample loudest hour, calculated from each of the three two power blocks.
3 This is a logarithmic sum of Existing and Calculated, not algebraic.

Leq = Equivalent Sound Level
dBA = A-weighted decibel
LT = Long Term
ST = Short Term
ACN HSBN = Aggregate ConstructionHigh-pressure Steam Blow Noise

Assumed to occur only during the day, estimated un-muffled steam blow noise levels would all be greater than 60range from 63 to 58 dBA hourly Leq at receptors and expected to cause an increase over the existing ambient sound levels of up to 31 28 dBA. While considered construction noise and thus exempt from Riverside County noise ordinance thresholds, these un-muffled sound level estimates and their increases over pre-Project ambient sound indicate a noise impact with respect to CEC siting guidance and a clear need for industry-standard sound muffling devices for high pressure steam blows. This analysis therefore assumes that the Project design and construction process will incorporate such typical sound abatement measures, so that the resulting expected sound level will not cause more than a 10 dBA increase over pre-project ambient sound level. Based on Table 5.7-10, such measures would need to demonstrate (or be designed to perform) at least 21 18 dBA of noise reduction with respect to receptor LT1c. With such measures installed, steam blow noise is expected to be a less than significant impact.

Construction Occupational Noise Exposure (no changes)

Construction Laydown, Staging, and Parking Areas

Per Section 2.2.16, tThe construction laydown and parking areas will be located in and around the common areaalong the eastern project edge and immediately south of 32nd Avenue and at each of the three two power blocks. Contractors and equipment suppliers will use the laydown areas during construction to coordinate delivery of equipment and materials, construction, and construction worker parking and processing. The primary noise concern for the construction laydown areas would be the truck staging area, where a truck may idle with its engine running. If one then assumes this truck (reference

SPL at 50 feet = 84 dBA Leq, and 40 percent acoustical usage factor, per Table 5.7-5) and an operating forklift (85 dBA Leq at 50 feet, with 50 percent acoustical usage, per FHWA) are the loudest two types of equipment at this location, the composite noise level would be 88 dBA Leq at 50 feet. Since the closest representative noise-sensitive receptor to the common areasconstruction staging area is LT2 and approximately 8,200 feet away, the expected noise level would be no greater than 36 dBA. This level complies with local LORS and would cause no increase to the 53 dBA Leq daytime ambient at LT2. Therefore, the noise effect from the construction laydown area is anticipated to be less than significant.

Construction Traffic

During the construction period, there would be traffic increase on State Route 78, along which some representative noise-sensitive receptors are located. Based on hour-long traffic counts taken as part of the ambient noise field survey, State Route 78 currently sees the following traffic volumes by vehicle type at the indicated locations in Table 5.7-11.

Table 5.7-11
Sample Pre-Project hourly State Route 78 Traffic Counts (no changes)

According to Caltrans data from 2009, the total average annual daily traffic (AADT) recorded at 28th Avenue and Neighbors Boulevard is 1,800 vehicles and 216 for trucks (Caltrans, 2010). Dividing these values by 24 yields averages of 75 and nine, respectively, which appear to reasonably fall within the value ranges (i.e., daytime and nighttime) from the observed counts.

Table 5.12-8 from Section 5.12.3 indicates that the construction-caused change in average daily traffic (ADT) volumes on the North of 30th Avenue and South of 34th Avenue segments of State Route 78 will not exceed 10067 percent; thus, the corresponding daily noise level should not increase by more than 3 dBA and thereby be considered a less than significant impact.

5.7.5.2 Operational Noise

Prediction Methods

The Cadna/A® Noise Prediction Model (Version 4.1.1372.140) was used to estimate the aggregate sound pressure levels from nominal project operations at the noise-sensitive receptors, which are illustrated for the two a "worst-case" scenarios (i.e., all threeboth solar power towers at full rated operation, and during startup) in Figures 5.7-1 and 5.7-2. Cadna/A® is a Windows® based software program that predicts noise levels near industrial noise sources based on ISO 9613-2 standards for outdoor sound propagation calculation. The model uses these industry-accepted propagation algorithms and accepts sound power levels (Lw, in dB re: one pico Watt) provided by the equipment manufacturer and other sources. In the case of this operational noise analysis, Lw for nominal steady-state operation at OBCF resolution was confidentially provided by the Applicant's design engineer, Bechtel Corporation. The software's calculations account for classical sound wave geometric divergence, plus attenuation factors resulting from air absorption, basic ground effects, and barrier/shielding. In order to account for ground effects, the topographical data was incorporated into Cadna/A® as part of the model space.

From the Applicant’s supplied Lw values for various equipment located in each power block, the noise sources are divided into four approximate elevation groups for the full operation:

- The SRSG, which is located approximately 750 feet above the ground;
- The Air Cooled Condenser (ACC) rectangular fan array, which is planar and parallel with the ground surface at a relative height of 60 feet (i.e., above grade) and contains a total of 30 fans;
- The Auxiliary Boiler stack discharge at 135 feet; and
- All other noise sources approximately 10 feet above the ground.

Table 5.7-12 summarizes the A-weighted overall Lw for each noise source elevation group, for three model scenarios as follows:

- “Full” operation – either relying solely on insolation (and thus, the SRSG) for 100 percent of the plant’s thermal source, or the Auxiliary Boilers (i.e., burning natural gas for thermal energy). Assumed to occur~~, at most,~~ during most of the entire 15-hour “daytime” period (7 ~~p~~a.m. to 10 p.m.) plus as many~~uch~~ as 2.5~~one~~ additional hours at night (e.g., from 4:30~~10~~ a~~p~~.m. to 7~~11~~ a~~p~~.m.) for several system components.
- “Startup” operation – a set of systems, ~~smaller in quantity than~~including some from the “full” operation scenario above, ~~and in some cases~~ involving unique equipment ~~(e.g., Startup Boiler)~~ that is generally a~~. A~~ssumed to be active~~occur, at most,~~ during ~~two~~ an early morning “nighttime” hour ~~hours~~from ~~(e.g.,~~ 4:30~~5~~ a.m. to 5:30~~7~~ a.m.~~)~~.
- “Nighttime preservation” operation ~~– like Startup,~~ a small set of equipment intended to maintain minimal plant operation when needed. Assumed to occur~~, at least,~~ during ~~six~~ a combination of “daytime” and “nighttime” hours ~~(e.g.,~~from ~~11~~ 8 p.m. to 5:30 a~~p~~.m.~~)~~.

The suggested timeframes ~~during the day~~for these scenarios are consistent with ~~the high end of the eight to 16 hour range expected for full operation capacity as described in Section 2.0~~design information received from Bechtel Corporation. Additional model configuration settings and assumptions are as follows:

- *Outdoor temperature*: 20 degrees Celsius (ºC)
- *Relative humidity*: ~~50~~ 90 percent
- *Average wind speed*: zero (i.e., the analysis considers a wind-neutral scenario)
- *Average ground absorption*: 0.35 (representing a conservative blend of hard, reflective surfaces that tend towards zero, and highly absorptive ground cover that approaches unity)
- *Heliostat actuators*: while there are large numbers of these potential sources, they are spread across the vast project area and are expected to operate infrequently. However, they are not considered a significant aggregate noise source to model.
- *Common area*: while there are a few permanent buildings at this general location that will have operating HVAC systems, they are not considered a significant aggregate noise source to model.

- *Gas metering stations*: the model includes a single 100 dBA L_w point source that represents the combination of an above-ground pressure regulating valve (PRV) and 10-foot length of above-ground gas-conveying piping. Both the piping and the PRV are externally insulated with 2” thick thermal/acoustic lagging.

Table 5.7-12
Operational Noise Sources per Power Block

Noise Sources	Model Source Height (ft)	Aggregate Sound Power Level (dBA)
Full Operation		
SRSG	750	109
ACC Fans (30 Fans)	60	121
Auxiliary Boilers	135	106
Other Sources Combined[1]	10	127
Startup/Shutdown Operation		
Start-upAuxiliary Boiler	10135	104106
ACC Bypass	10	125
ACC Fans (5 Fans)	60	114
Start-up Vents	10	125
Other Sources Combined[2]	10	113120

Table 5.7-12
Operational Noise Sources per Power Block

Noise Sources	Model Source Height (ft)	Aggregate Sound Power Level (dBA)
Nighttime Preservation Operation		
All Sources Combined[3]	10	107

Source: Bechtel ~~2011~~2012

1. Noise Sources include approximately 20 different types of equipment~~ pieces~~, such as pumps, fans, and transformers.

2. Noise Sources include~~s~~ pumps, fans, ~~and start-up vents~~and blow-down tanks.

3. Noise Sources include pumps, fans, and preservation boiler.

ACC = Air Cooled Condenser
dBA = A-weighted decibel
ft = feet
SRSG = Solar Receiver Steam Generator

Predicted Operation Noise at Sensitive Receptors

Predictive Cadna/A-based noise levels during "full" and "startup" operation mode scenarios are shown and included in Figures 5.7-1 and 5.7-2, respectively. The figures depict~~s~~ equal sound level isopleths or~~o-dB level~~ contours for the Project in decrements of five dB, at an assumed typical receptor height of approximately five feet. The results of the predictive Cadna/A-based calculations at specific geographical locations are summarized in Tables 5.7-13 and 5.7-14 and ~~are~~ compared against measurements of ambient noise levels taken at these same locations ~~as measured~~ during the summer of 2011.

Table 5.7-13
Predicted Full Operation Levels at Representative Noise-Sensitive Receptors

Noise-Sensitive Receptor Identification	Existing Ambient (hourly L90, dBA) [1]	Existing Ambient (hourly Leq, dBA) [1]	Project as Designed		
			Predicted Operation (hourly Leq, dBA)	Existing + Predicted [2] (hourly Leq, dBA)	Increase Over Existing (Leq, dBA)
LT1a	30	41	~~29~~33	~~41~~42	~~0~~1
LT1b	38	40	~~29~~33	~~40~~41	~~0~~1
LT1c	31	34	~~29~~32	~~35~~36	~~1~~2
LT2	37	48	35	48	0
ST1	38	40	~~31~~33	41	1
ST2	35	54	~~33~~36	54	0

Notes:
[1] Quietest daytime or nighttime hour (of those actually measured for ST1 and ST2), or algebraic average of 4 quietest daytime or nighttime hours at LTs.
[2] This is a logarithmic sum of Existing and Calculated, not algebraic.

dBA = A-weighted decibel
LT = Long Term
Leq = Equivalent Sound Level
L90 = Sound Level exceeded 90% of the measurement period

Table 5.7-14
Predicted Startup Operation Levels at Representative Noise-Sensitive Receptors

Noise-Sensitive Receptor Identification	Existing Ambient (hourly L90, dBA) [1]	Existing Ambient (hourly Leq, dBA) [1]	Project as Designed		
			Predicted Operation (hourly Leq, dBA)	Existing + Predicted [2] (hourly Leq, dBA)	Increase Over Existing (Leq, dBA)
LT1a	30	41	35	42	1
LT1b	38	40	35	41	1
LT1c	31	34	35	38	4
LT2	37	48	36	48	0
ST1	38	40	33	41	1
ST2	35	54	36	54	0

Notes:
[1] Quietest daytime or nighttime hour (of those actually measured for ST1 and ST2), or algebraic average of 4 quietest daytime or nighttime hours at LTs.
[2] This is a logarithmic sum of Existing and Calculated, not algebraic.

dBA = A-weighted decibel
LT = Long Term
Leq = Equivalent Sound Level
L90 = Sound Level exceeded 90% of the measurement period

The nighttime or daytime quietest hour (or average of four consecutive hours, for the LTs) is used as the existing ambient baseline in Table 5.7-13 because the worst-case full operation mode will occur through all 15 daytime hours and at least one nighttime hour. Similarly, the same quietest existing ambient hour is used as the baseline for Table 5.7-14 due to startup activity occurring in early morning hours but still considered a "nighttime" period.

For an electricity generation facility like the Project that is expected to operate essentially under "steady-state" conditions, and for which equipment sound power data representing nominal steady-state operation was available and used as input parameters for the Cadna/A-based prediction model, this analysis assumes that the predicted operation sound values in Tables 5.7-13 and 5.7-14 represent hourly Leq but would not be substantially different from an Lmax during that same hour-long period. Ideally, true steady-state operation would mean that the same Lmax operation sound level would occur continuously and thus make for an equivalent Leq. In the real world, some variance between Lmax and Leq occurs, but this analysis further assumes that the anticipated difference between the two metrics over a given nominal hour is no greater than 5 dBA. In other words, if measurable at a receptor, aggregate sound from project operations may reach 45 dBA Lmax during a given hour when steady-state operation is anticipated, but the Leq may be as low as 40 dBA.

Utilizing this assumed relationship between Lmax and Leq to represent project operation sound and thus allow indirect comparison with the Riverside County impact indicator of 45 dBA Lmax, the predicted full operation noise levels from Table 5.7-13 and the predicted startup operation noise levels from Table 5.7-14 do not exceed 40 dBA hourly Leq at noise-sensitive receptors nor cause an increase greater than 5 dBA over the existing ambient sound levels. For both of these reasons, full power generation operation noise from the Project is expected to be a less than significant impact.

For the ~~"Startup" and~~ "Nighttime preservation" operation scenario~~s~~, predicted aggregate noise levels from the ~~three~~ two power blocks are~~is~~ expected to be less than the full operation predicted noise levels at each noise-sensitive receptor; thus, neither of these operation modes will result in a significant noise impact.

Plant Maintenance Noise

For most nighttime hours, when "full" plant power generation will not occur, "Startup" and "Nighttime Preservation" operation modes will generate less than significant noise impacts. However, it is during this time when routine plant maintenance may occur, including activities such as mirror washing. Because this activity can occur as close to a representative noise-sensitive receptor as the nearest ~~project boundary~~heliostat installation, nighttime maintenance noise should be considered and analyzed in a manner similar to construction noise, where sound from two probable loudest sources propagates to the receptors. Table 5.7-~~14~~ 15 presents predicted maintenance noise using this technique.

Table 5.7-~~14~~15
Predicted Nighttime Maintenance Noise Levels
at Representative Noise-Sensitive Receptors

Noise-Sensitive Receptor Identification	Existing Ambient (hourly Leq, dBA) [1]	Project as Designed		
		Composite Maintenance Source (hourly Leq, dBA)	Existing + Composite [2] (hourly Leq, dBA)	Increase Over Existing (Leq, dBA)
LT1a	46	~~32~~30	46	0
LT1b	40	~~32~~30	~~41~~40	~~1~~0
LT1c	34	~~32~~30	~~36~~35	~~2~~1
LT2	48	30	48	0
ST1	40	27	40	0
ST2	54	28	54	0

Notes:
[1] Measured nighttime hour (for ST1 and ST2), or algebraic average of 4 quietest nighttime hours at LTs.
[2] This is a logarithmic sum of Existing and Calculated, not algebraic.
dBA = A-weighted decibel
LT = Long Term
Leq = Equivalent Sound Level

Based on a combined reference noise level of 84 dBA at 50 feet, which assumes a pressure washer pump operates continuously (i.e., 77 dBA at 100 percent usage factor) and a truck idles or moves the washer up to a cumulative third of a given hour (i.e., 84 dBA at 33 percent usage factor), the predicted composite maintenance source noise levels do cause an expected increase over existing ambient, but not beyond the CEC siting guideline for potential noise impacts. (For purposes of predictive analysis conservatism, and as was done for construction noise prediction, three dBA was algebraically added to the logarithmic sum of these two assumed loudest sources for this maintenance activity.) Additionally, the composite maintenance sound source is less than 40 dBA hourly Leq, and if considered "steady-state" due to the continuous operation of the pressure washer pump, would on the basis of the assumed Lmax to Leq relationship described in Section 5.7.5.2 thus comply with the Riverside County threshold. Hence, for both reasons, project maintenance noise is considered to be less than significant.

Occupational Noise *(no changes)*

Power Transmission *(no changes)*

Tonal Noise *(no changes)*

Ground and Airborne Vibration *(no changes)*

5.7.6 Cumulative Effects (no changes)

5.7.7 Mitigation Measures (no changes)

5.7.8 Involved Agencies and Agency Contacts

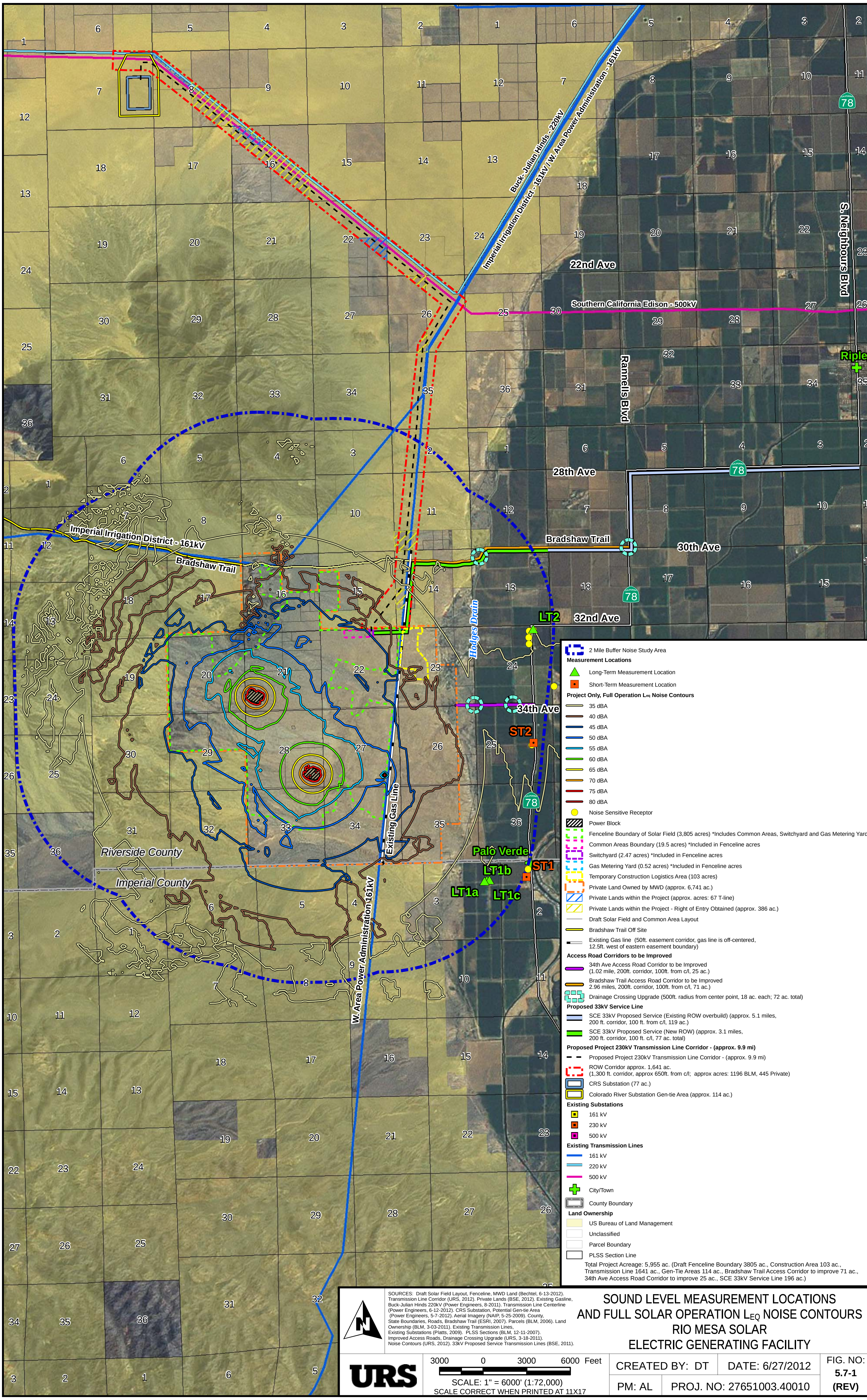
Agencies with jurisdiction to enforce LORS related to noise are shown in Table ~~5.12-15~~ 5.7-16.

Table 5.7-~~15~~16
Agency Contacts

Agency	Contact	Address	Telephone
Bureau of Land Management	Cedric Perry	Bureau of Land Management 22835 Calle San Juan de Los Lagos Moreno Valley, CA 92553-9046	(951) 697-5200
California Occupational Safety and Health Administration	Victoria Heza	7575 Metropolitan Dr #400 San Diego, CA 92108	(619) 767-2060
California Energy Commission	Pierre Martinez	1516 Ninth Street Sacramento, CA 95814	(916)-651-3765
Riverside County Public Health Department, Office of Industrial Hygiene	Steve Hinde	4065 County Circle Drive, #304Riverside, CA 92503	(951) 358-5096

5.7.9 Permits Required and Permit Schedule (no changes)

5.7.10 References (no changes)



SOURCES: Draft Solar Field Layout, Fenceline, MWD Land (Bechtel, 6-13-2012). Transmission Line Corridor (URS, 2012). Private Lands (BSE, 2012). Existing Gasline, Buck-Julian Hinds 220kV (Power Engineers, 8-2011). Transmission Line Centerline (Power Engineers, 6-12-2012). CRS Substation, Potential Gen-tie Area (Power Engineers, 5-7-2012). Aerial Imagery (NAIP, 5-25-2009). County, State Boundaries, Roads, Bradshaw Trail (ESRI, 2007). Parcels (BLM, 2006). Land Ownership (BLM, 3-03-2011). Existing Transmission Lines, Existing Substations (Platts, 2009). PLSS Sections (BLM, 12-11-2007). Improved Access Roads, Drainage Crossing Upgrade (URS, 3-18-2011). Noise Contours (URS, 2012). 33kV Proposed Service Transmission Lines (BSE, 2011).

SOUND LEVEL MEASUREMENT LOCATIONS AND FULL SOLAR OPERATION L_{EQ} NOISE CONTOURS
RIO MESA SOLAR
ELECTRIC GENERATING FACILITY

URS

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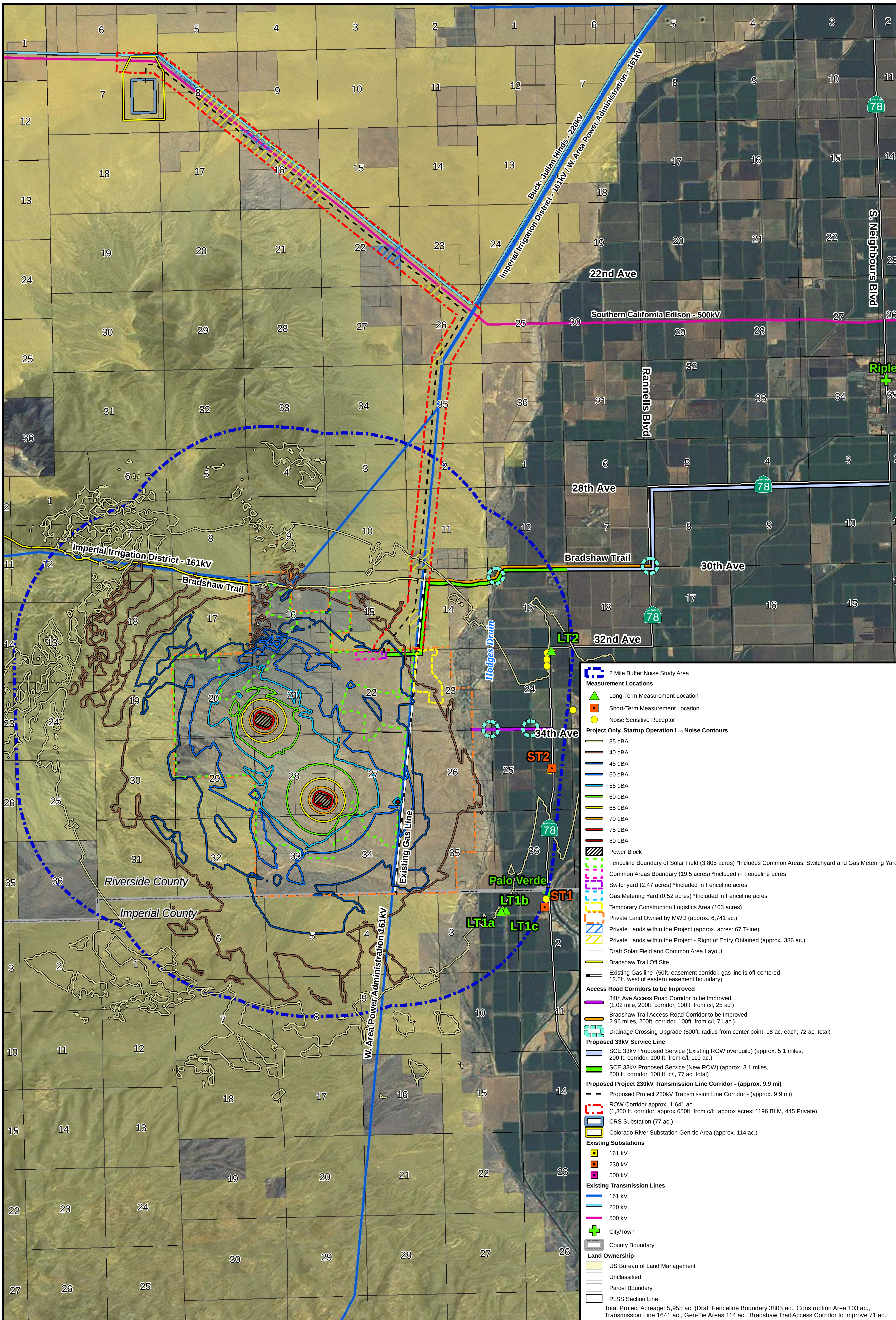

SOURCES: Draft Solar Field Layout & Fenceline, MWD Land (Bechtel, 6-13-2012). Transmission Line Corridor (URS, 6-14-2012). Private Lands (BSE, 2012). Existing Gasline, Transmission Line Centerline, Buck-Julian Hinds 220kV (Power Engineers, 6-14-2012). CRS Substation, Potential Gen-tie Area (Power Engineers, 5-7-2012). Aerial Imagery (NAIP, 5-25-2009). County, State Boundaries, Roads, Bradshaw Trail (ESRI, 2007). Parcels (BLM, 2006). Land Ownership (BLM, 3-03-2011). Existing Transmission Lines, Existing Substations (Platts, 2009). PLSS Sections (BLM, 12-11-2007). Improved Access Roads, Drainage Crossing Upgrade (URS, 3-18-2011). Noise Contours (URS, 2012). 33kV Proposed Service Transmission Lines (BSE, 2011).

SOUND LEVEL MEASUREMENT LOCATIONS AND STARTUP OPERATION L_{EQ} NOISE CONTOURS RIO MESA SOLAR ELECTRIC GENERATING FACILITY

URS

3000 0 3000 6000 Feet

SCALE: 1" = 6000' (1:72,000)
SCALE CORRECT WHEN PRINTED AT 11X17

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