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**Technical Noise Study for the Proposed
Mangular Blending Facility
in Corona, California**

**Project File 12.006.01
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1 Introduction / Project Description

The purpose of this study is to identify and assess the potential noise impacts associated with the operation of the City of Corona Department of Water and Power's proposed Mangular Blending Facility in the City of Corona. The new Mangular Facility will be constructed within Mangular Park as shown in Figures 1-1 and 1-2. The site is bounded on the north by Ontario Avenue; on the east by the buried Mangular Reservoir (the reservoir is located beneath a pair of tennis courts) and Mangular Avenue; on the south by a portion of Mangular Park; and on the west by a portion of Mangular Park (including a tot lot and parking lot) and Patriot Way. Beyond the adjacent park and streets, the Project is surrounded in all directions by single-family homes.

The new Mangular Blending Facility will replace the existing Mangular Booster Pump Station (BPS), blending station, and motor control center (MCC), chloramination disinfection facilities at Well 11, and the Border BPS. It will consist primarily of a one-story, four-room building. A generator room will house an emergency diesel generator; a sodium hypochlorite storage room and an ammonia storage room will contain storage tanks for these chemicals, along with their associated metering pumps; and a pump room will contain five vertical turbine pumps (three duty and two standby). The vertical turbine pump columns and bowl assemblies will be in pump cans, located directly below the pump room, but the pump motors and discharge head assembly will be located within the pump room. Various other electrical and control systems will also be located within the building. The building will be ventilated via louvers in the exterior doors and walls, and roof-mounted exhaust fans. An exterior fuel tank will be located south of the building and a chemical fill station will be located on the entry driveway where it can be accessed by large chemical delivery trucks. The Project will also require a new 1,250 kVA transformer to be installed by Southern California Edison (SCE) at the northeast corner of Mangular Park, near the intersection of Ontario Avenue and Mangular Avenue.

The following noise control measures have been included in the design of the Project and are incorporated into the noise analyses conducted for this study: solid-grouted concrete masonry unit (CMU) wall construction, noise level limits for the equipment, a super critical grade exhaust silencer for the emergency generator, silencers at the ventilation (intake and exhaust) louvers in the emergency generator room, sound-rated entry doors at the emergency generator room, a sound-absorptive acoustical roof deck throughout the building, and sound-absorptive acoustical panels on the interior of the walls in the pump room and the emergency generator room. For the emergency generator room, these noise control features were determined by the Project engineer to represent typical best practices for noise control at this type of installation.



Figure 1-1. Layout of Existing and Proposed Facilities at Project Site



Figure 1-2. Proposed Site Plan

2 Noise Descriptors

The following sections briefly describe the noise descriptors that will be used throughout this study:

2.1 Decibels

The magnitude of a sound is typically described in terms of sound pressure level (SPL) which refers to the root-mean-square (rms) pressure of a sound wave and can be measured in units called microPascals (μPa). However, expressing sound pressure levels in terms of μPa would be very cumbersome since it would require a very wide range of numbers (approximately 20 to 20,000,000 μPa over the entire range of human hearing). For this reason, sound pressure levels are stated in terms of decibels, abbreviated dB. The decibel is a logarithmic unit that describes the ratio of the actual sound pressure to a reference pressure (20 μPa is the standard reference pressure level for acoustical measurements in air). Specifically, a sound pressure level, in decibels, is calculated as follows:



$$SPL = 20 \log_{10} \left(\frac{X}{20 \mu Pa} \right)$$

where X is the actual sound pressure and $20 \mu Pa$ is the reference pressure.

Since decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces a sound pressure level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB. In fact, they would combine to produce 73 dB.

2.2 A-Weighting

While sound pressure level defines the amplitude of a sound, this alone is not a reliable indicator of loudness. Human perception of loudness depends on the characteristics of the human ear. In particular, the frequency or pitch of a sound has a substantial effect on how humans will respond. Human hearing is limited not only to the range of audible frequencies, but also in the way it perceives sound pressure levels within that range. In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, and perceives both higher and lower frequency sounds of the same magnitude as being less loud. In order to better relate noise to the frequency response of the human ear, a frequency-dependent rating scale, known as the A-Scale, is used to adjust (or “weight”) the sound level measured by a sound level meter. The resulting sound pressure level is expressed in A-weighted decibels or dBA. When people make relative judgments of the loudness or annoyance of most ordinary everyday sounds, their judgments correlate well with the A-scale sound levels of those sounds. A range of noise levels associated with common indoor and outdoor activities is shown in Figure 2-1.

2.3 Equivalent Sound Level (L_{eq})

Many noise sources produce levels that fluctuate over time; examples include mechanical equipment that cycles on and off, or construction work which can vary sporadically. The equivalent sound level (L_{eq}) describes the average acoustic energy content of noise for an identified period of time, commonly 1 hour. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustical energy over the duration of the exposure. For many noise sources, the L_{eq} will vary depending on the time of day – a prime example is traffic noise which rises and falls depending on the amount of traffic on a given street or freeway.

2.4 Day-Night Sound Level (L_{dn})

It is recognized that a given level of noise may be more or less tolerable depending on the duration of the exposure experienced by an individual, as well as the time of day during which the noise occurs. The day-night sound level (L_{dn}) is a measure of the cumulative 24-hour noise exposure that considers not only the variation of the A-weighted noise level but also the duration and the time of day of the disturbance. The L_{dn} is derived from the twenty-four A-weighted 1-hour L_{eq} s that occur in a day, with “penalties” applied to the L_{eq} s occurring during the nighttime hours (10 p.m. to 7 a.m.) to



account for increased noise sensitivity during these hours. Specifically, the L_{dn} is calculated by adding 10 dBA to each of the nighttime L_{eqs} , and then taking the average value for all 24 hours. It is noted that various federal, state, and local agencies have adopted L_{dn} as the measure of community noise, including the United States Environmental Protection Agency (EPA). Figure 2-2 indicates the typical outdoor L_{dn} at various locations for typical noise sources.

2.5 Percentile-Exceeded Noise Level (L_n)

The percentile-exceeded noise level, designated L_n , describes the noise level that is equaled or exceeded by a fluctuating sound level n percent of a stated time period. For example, the L_{50} is the sound level which is equaled or exceeded for 50 percent of the time period (equivalent to 30 minutes in an hour) and the L_{25} is the sound level which is equaled or exceeded for 25 percent of the time period (equivalent to 15 minutes in an hour).

2.6 Maximum Sound Level (L_{max})

The maximum sound level refers to the maximum root mean squared (RMS) level that occurs during a noise measurement. More specifically, L_{max} is the RMS sound level that corresponds to the noisiest 1-second interval during the measurement.

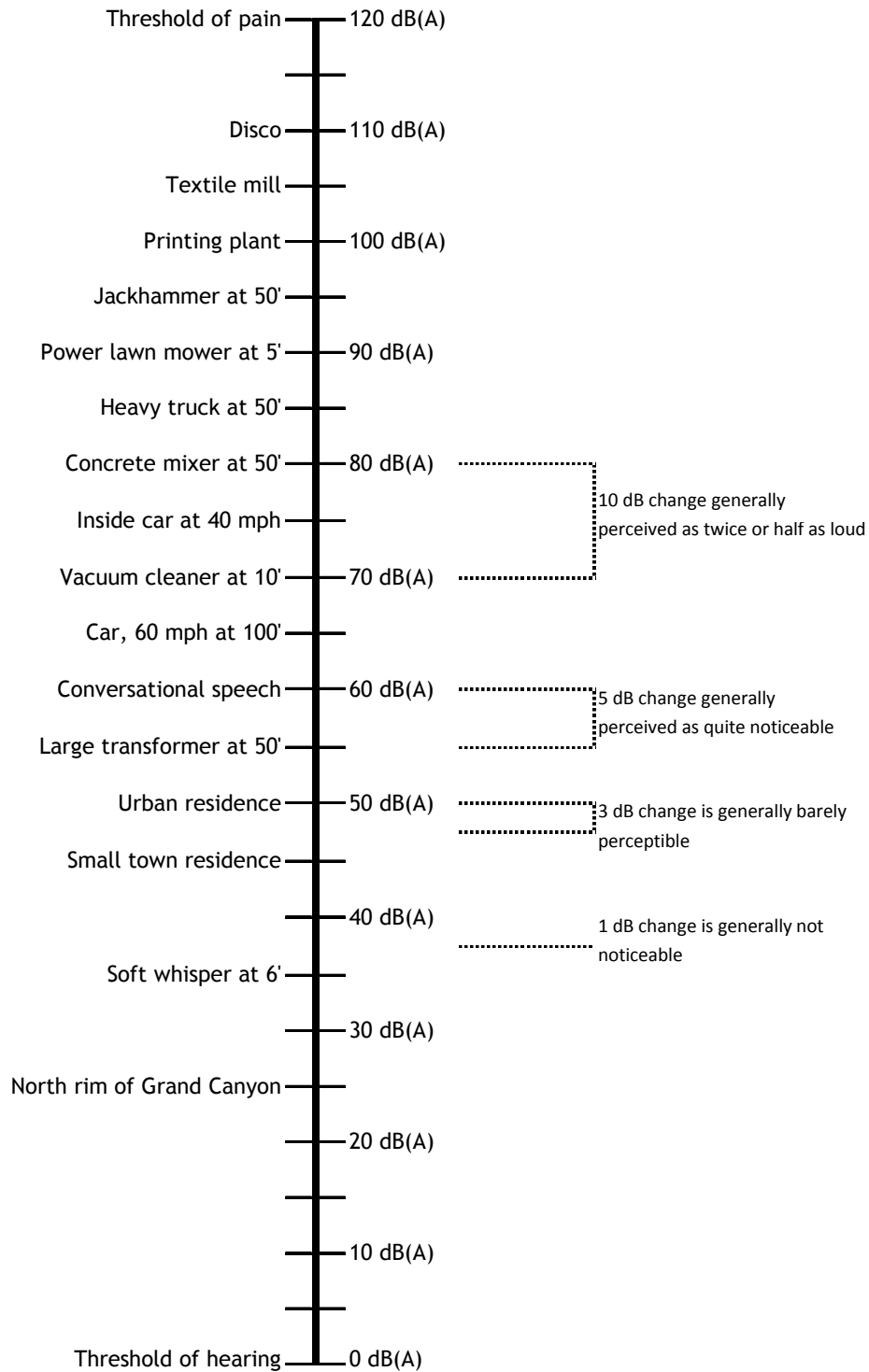


Figure 2-1. Common Noise Sources and A-Weighted Noise Levels

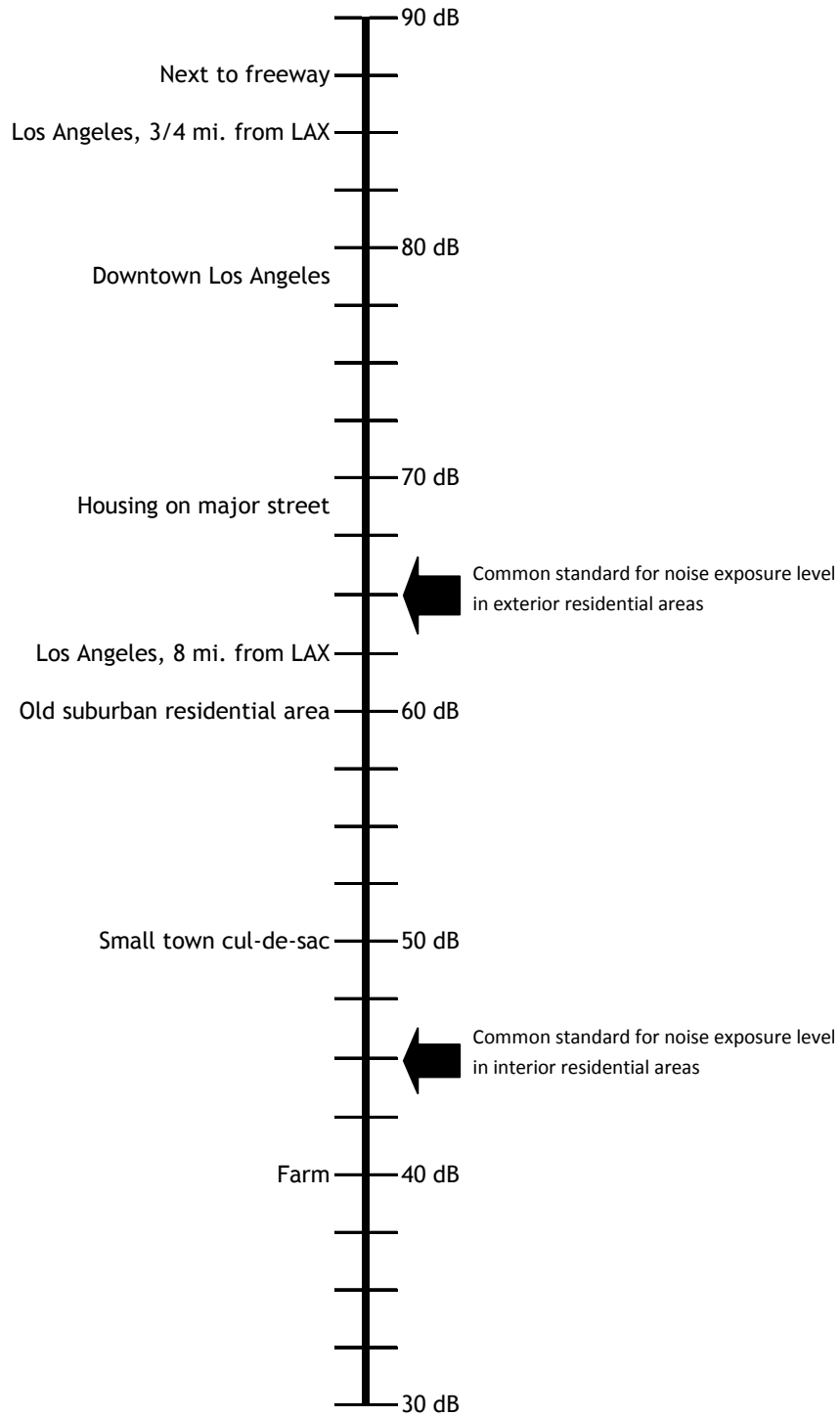


Figure 2-2. Common CNEL or L_{dn} Noise Exposure Levels at Various Locations



3 Noise Criteria

3.1 City of Corona General Plan

The following summarizes those policies from the Noise Element of the General Plan for the City of Corona that are relevant to the Project with regard to noise:

- ④ 11.4.6. – “Require new nonresidential development to design and configure onsite ingress and egress points to divert traffic away from “noise sensitive” land uses, to the greatest extent practicable.”
- ④ 11.5.2 – “Require new industrial and new commercial land uses or the major expansion of such uses to demonstrate that ambient noise levels will not exceed an exterior noise level of 65 dBA L_{dn} on areas containing “noise sensitive”¹ land uses...”
- ④ 11.5.5 – “Require development that generates increased traffic and substantial increases in ambient noise levels adjacent to noise sensitive land uses, to provide appropriate mitigation measures in accordance with the acceptable limits of the City Noise Ordinance.”
- ④ 11.7.1 – “Provide for the reduction in noise impacts from commercial and industrial noise sources as controlled and enforced through the Community Noise Ordinance.”

3.2 City of Corona Municipal Code

The City of Corona noise standards for stationary noise sources (which are defined to include industrial noise) are defined in Title 17 (*Zoning*), Chapter 17.84.040 of the City’s municipal code. The standards vary depending on the land use of the affected property and include maximum permissible exterior and interior noise levels for four different land use categories: (1) residential; (2) “other sensitive land uses”; (3) commercial; and, (4) industrial, manufacturing, or agricultural. The only properties in the vicinity of the Project that fall under any of these categories are the surrounding homes. Table 3-1 summarizes the noise standards that apply to residential properties.

¹ Noise-sensitive land uses are defined in the Corona Municipal Code, Section 17.84.040, as follows: “Those specific land uses which have associated human activities that may be subject to stress or significant interference from noise. Sensitive land uses include single family residential, multiple family residential, churches, hospitals and similar health care institutions, convalescent homes, libraries and school classroom areas.”



Table 3-1. City of Corona Stationary Noise Source Standards for Residential Properties

Noise level that may not be exceeded for more than...	Descriptor	Exterior		Interior	
		Daytime (7 a.m. to 10p.m.)	Nighttime (10 p.m. to 7 a.m.)	Daytime (7 a.m. to 10p.m.)	Nighttime (10 p.m. to 7 a.m.)
30 minutes in any hour	L ₅₀	55 dBA	50 dBA	N/A	N/A
15 minutes in any hour	L ₂₅	60 dBA	55 dBA	N/A	N/A
5 minutes in any hour	L ₈	65 dBA	60 dBA	45 dBA	35 dBA
1 minute in any hour	L ₂	70 dBA	65 dBA	50 dBA	40 dBA
Anytime	L _{max}	75 dBA	70 dBA	55 dBA	45 dBA

The City code also indicates that the noise standards shall be adjusted based on the nature of the subject noise and the existing ambient noise levels, as follows:

- ⦿ For exterior noise standards: “In the event the ambient noise level exceeds any of the first four noise limit categories above, the cumulative period applicable to the category shall be increased to reflect the ambient noise level. In the event the ambient noise level exceeds the fifth noise category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.”
- ⦿ For both exterior and interior noise standards: “Each of the noise limits specified here shall be reduced by 5 dBA for impulse or simple tone noises; provided, however, that if the ambient noise level exceeds the resulting standards, the ambient shall be the standard.”

The City of Corona amended Section 17.84.040 of the City of Corona Municipal Ordinance with the approval of Ordinance 3188. The amendment added the following exemption from the noise standards.

“Short term non-continuous operations associated with government and non-government facilities to maintain public health and safety.”

The above amendment exempts noise from operational activities characterized as short-term non-continuous operations associated with government and non-government facilities to maintain public health and safety. Since the proposed Mangular Blending Facility is to improve water quality and quantity for residents within the City of Corona, the stationary noise source standards identified in Section 17.84.040 of the City of Corona Municipal Ordinance do not apply to the non-continuous operations associated with the proposed Project.

4 Existing Noise Environment

The sensitive land uses within the study area consist of single-family homes that surround Mangular Park. The primary existing source of noise that affects the study area is traffic on the surrounding streets. Secondary noise sources include activities at Mangular Park (including the tennis courts and



tot lot) and typical neighborhood noise sources (dogs barking, landscaping activities, home maintenance activities, etc.).

In order to document the existing noise environment, measurements were obtained at four locations throughout the study area. (Refer to Figure 4-1.) At two locations (Positions #1 and #3), the noise measurement was obtained over a continuous 95-hour period that encompassed both weekdays and a weekend. At the remaining two locations (Positions #2 and #4), the ambient noise measurements were obtained on four occasions for a period of at least 30 minutes on each occasion. These four occasions were: (1) on a weekday during daytime hours, (2) on a weekday during nighttime hours, (3) on a weekend during daytime hours, and (4) on a weekend during nighttime hours. During each measurement, extraneous noise sources (such as sirens) were excluded by placing the sound level meter on “standby” until the noise event was concluded. Every measurement was obtained with the measurement microphone at a height of five feet above the ground. The results of the noise measurements, provided in Appendix I, are summarized in Tables 4-1 and 4-2.

Table 4-1. Summary of Weekday Ambient Noise Measurements

Location #	Location Description	Measurement Period	Measured Noise Levels, dBA		L _{dn} , dB
			Daytime (7 a.m. to 10p.m.)	Nighttime (10 p.m. to 7 a.m.)	
1	2190 Newton Drive, rear yard	95 hours	L ₅₀ : 51.2 - 58.7 L ₂₅ : 54.7 - 62.0 L ₈ : 57.5 - 64.3 L ₂ : 61.0 - 65.9 L _{max} : 67.1 - 89.4	L ₅₀ : 39.7 - 56.5 L ₂₅ : 41.2 - 58.4 L ₈ : 46.9 - 60.8 L ₂ : 52.4 - 64.7 L _{max} : 60.8 - 84.4	59.9 - 60.4
2	2211 Mangular Avenue, front yard	3:27 p.m. to 3:58 p.m. and 2:41 a.m. to 3:11 a.m.	L ₅₀ : 56.4 L ₂₅ : 60.2 L ₈ : 63.4 L ₂ : 67.0 L _{max} : 82.5	L ₅₀ : 40.4 L ₂₅ : 41.8 L ₈ : 47.5 L ₂ : 55.1 L _{max} : 71.4	Not measured
3	1425 Potomac Drive, rear yard	95 hours	L ₅₀ : 47.6 - 54.0 L ₂₅ : 48.6 - 55.5 L ₈ : 49.9 - 63.1 L ₂ : 52.6 - 67.5 L _{max} : 58.8 - 72.6	L ₅₀ : 47.5 - 52.9 L ₂₅ : 47.8 - 53.5 L ₈ : 48.0 - 54.4 L ₂ : 48.4 - 55.5 L _{max} : 55.2 - 68.8	57.4 - 57.6
4	2276 Patriot Way, front yard	2:46 p.m. to 3:18 p.m. and 1:58 a.m. to 2:28 a.m.	L ₅₀ : 49.4 L ₂₅ : 51.3 L ₈ : 56.5 L ₂ : 61.8 L _{max} : 75.0	L ₅₀ : 40.1 L ₂₅ : 42.1 L ₈ : 44.4 L ₂ : 50.3 L _{max} : 65.9	Not measured



Table 4-2. Summary of Weekend Ambient Noise Measurements

Location #	Location Description	Measurement Period	Measured Noise Levels, dBA		L _{dn} , dB
			Daytime (7 a.m. to 10p.m.)	Nighttime (10 p.m. to 7 a.m.)	
1	2190 Newton Drive, rear yard	95 hours	L ₅₀ : 45.5 - 55.7 L ₂₅ : 52.3 - 57.5 L ₈ : 56.2 - 60.3 L ₂ : 58.9 - 65.7 L _{max} : 64.3 - 89.2	L ₅₀ : 39.4 - 49.9 L ₂₅ : 40.4 - 54.8 L ₈ : 45.8 - 57.7 L ₂ : 54.0 - 61.4 L _{max} : 61.0 - 76.6	57.1 - 58.6
2	2211 Mangular Avenue, front yard	2:33 p.m. to 3:06 p.m. and 2:39 a.m. to 3:19 a.m.	L ₅₀ : 56.7 L ₂₅ : 60.6 L ₈ : 64.6 L ₂ : 69.5 L _{max} : 78.8	L ₅₀ : 41.7 L ₂₅ : 42.9 L ₈ : 49.2 L ₂ : 54.6 L _{max} : 68.3	Not measured
3	1425 Potomac Drive, rear yard	95 hours	L ₅₀ : 47.6 - 52.6 L ₂₅ : 48.4 - 53.7 L ₈ : 49.6 - 55.7 L ₂ : 51.4 - 60.8 L _{max} : 56.0 - 78.1	L ₅₀ : 47.5 - 53.5 L ₂₅ : 47.8 - 53.9 L ₈ : 48.0 - 54.7 L ₂ : 48.7 - 57.6 L _{max} : 52.6 - 71.9	57.3 - 58.7
4	2276 Patriot Way, front yard	3:24 p.m. to 3:45 p.m. and 1:58 a.m. to 2:28 a.m.	L ₅₀ : 47.1 L ₂₅ : 48.8 L ₈ : 52.3 L ₂ : 60.5 L _{max} : 73.5	L ₅₀ : 39.2 L ₂₅ : 40.1 L ₈ : 43.4 L ₂ : 47.5 L _{max} : 55.7	Not measured

Referring to the measurement results of Tables 4-1 and 4-2, there were several occasions during which the ambient noise level exceeded the City’s noise standards at Positions #1, #2, and #3. (The ambient noise level at Position #4 remained below the City’s standards.) Thus, at these three positions it would be permissible to adjust the standards to compensate for the ambient. However, no adjustment to the City’s standards will be taken in this study for the following reasons:

1. Most of the time the ambient noise level was at or below the standards. There were relatively few hours when the ambient noise level exceeded the standards.
2. The Municipal Code adjusts the cumulative period applicable to a noise limit category rather than the actual noise limit. For example, the City’s daytime standard is 55 dBA for a cumulative period of no more than 30 minutes in an hour. If a noise measurement indicated that the ambient noise level was 55 dBA for a cumulative period of 40 minutes in an hour, then the noise standard would be adjusted from a cumulative period of 30 minutes to a cumulative period of 40 minutes, but the noise limit would remain at 55 dBA. Because the noise level from the proposed facility will be constant, adjusting the cumulative period applicable to the facility’s noise level makes no difference when assessing the impact of the facility. That is, it will produce the same noise level for 60 minutes every hour.

The instrumentation used to obtain the noise measurements consisted of integrating sound level meters (Models 712 and 820) and an acoustical calibrator (Model CAL200) manufactured by Larson Davis Laboratories. The accuracy of the calibrator is maintained through a program established by



the manufacturer, and is traceable to the National Bureau of Standards. All instrumentation meets the requirements of the American National Standards Institute (ANSI) S1.4.

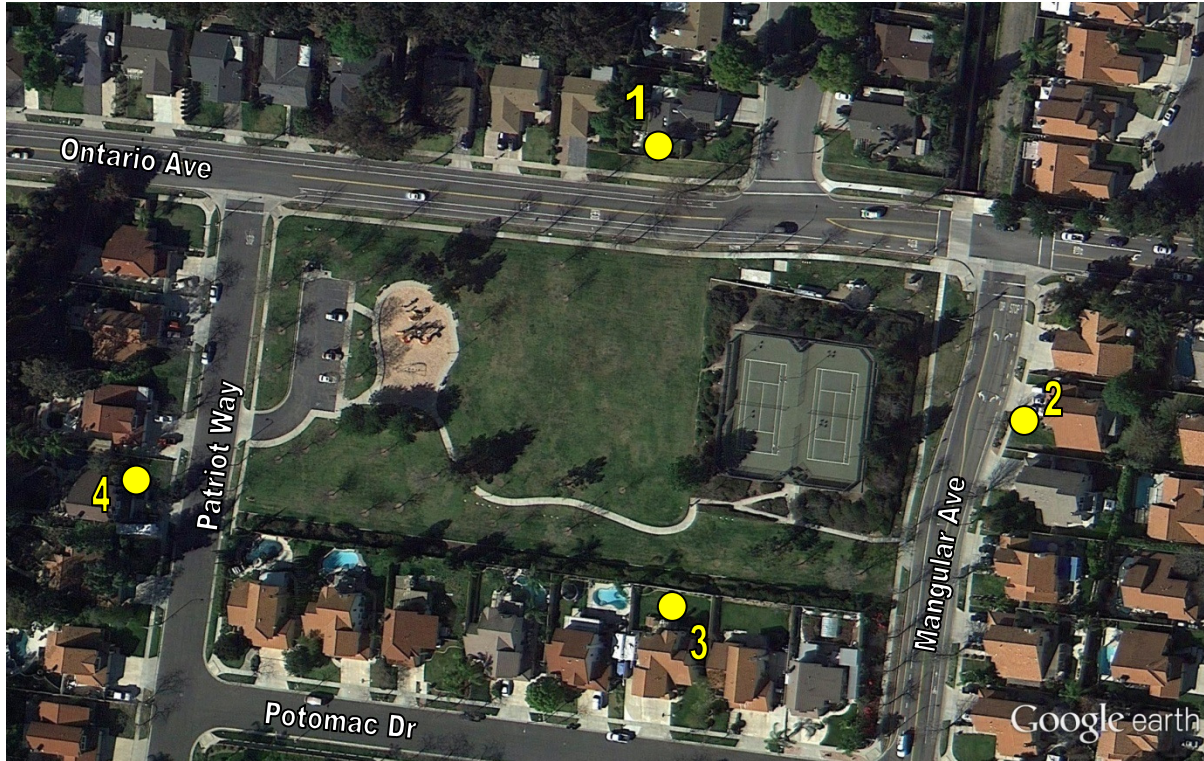


Figure 4-1. Ambient Noise Measurement Locations

5 Future Noise Conditions with Project

Based on the Project description and information provided by HDR, the analysis of operational noise considered five different scenarios, as follows:

Scenario 1. Typical day-to-day operations. This scenario considers noise from the mechanical equipment that will typically run throughout the daytime or nighttime hours. The analysis assumes that the following equipment items will run simultaneously for 30 minutes or more in an hour: three (3) vertical turbine pumps, one (1) sodium hypochlorite metering pump, one (1) ammonia metering pump, three (3) rooftop exhaust fans, and one (1) exterior transformer. It is assumed that this scenario may occur at any time during either the daytime or nighttime hours. Because the Project is still in the design phase, the specific equipment items (i.e., make and model) have not been selected and the exact acoustical data for each item is not yet available. Therefore, all equipment sound power levels used in the analysis are estimated using prediction algorithms based upon the available specifications for the equipment (motor horsepower, fan flow volumes, etc.).



Scenario 2. Testing of emergency generator. This scenario considers noise from routine testing of the emergency generator, as well as the typical day-to-day operations considered in Scenario 1. As part of the routine maintenance of the facility, the generator will be run, under no load conditions, for approximately one hour per month. This will occur while the rest of the facility is running as normal. It is assumed that emergency generator testing will only occur during daytime hours.

Scenario 3. Emergency generator operation. This scenario considers noise from emergency operation of the generator, as well as the typical day-to-day operations considered in Scenario 1. This scenario is intended to represent the situation that would occur if the facility lost power from the electrical grid. It is assumed that the generator would run at 100% load for an hour or more while the rest of the facility is running as normal and that such emergency conditions could occur at any time of the day or night.

Scenario 4. Chemical Deliveries. This scenario considers noise from the delivery of chemicals to the onsite storage facilities (via the chemical fill station), as well as the typical day-to-day operations considered in Scenario 1. The analysis assumes that a chemical delivery truck would enter from the east and park on the entry driveway adjacent to the chemical fill station and pump chemicals into the fill station for up to 90 minutes while the rest of the facility is running as normal. It is assumed that chemical deliveries will only occur during the daytime hours and that chemical deliveries will be scheduled so that they do not coincide with an emergency generator test (Scenario 2), emergency generator operation (Scenario 3), or a fuel delivery (Scenario 5). Noise levels for the chemical delivery truck were based on measurements of a sodium hypochlorite delivery obtained at the Sierra del Oro facility in Corona.

Scenario 5. Fuel Deliveries. This scenario considers noise from the delivery of diesel fuel to the onsite fuel tanks, as well as the typical day-to-day operations considered in Scenario 1. The analysis assumes that a fuel truck would enter from the east and park on the entry driveway and pump fuel into the tanks for up to 30 minutes while the rest of the facility is running as normal. It is assumed that fuel deliveries will only occur during daytime hours and that fuel deliveries will be scheduled so that they do not coincide with an emergency generator test (Scenario 2) or a chemical delivery (Scenario 4).

Because the continuous noise sources considered in Scenario 1 (typical day-to-day operations) are expected to operate for 30 minutes or more in an hour, the estimated noise levels will be assessed against the L_{50} standard of the City of Corona's municipal code. It is possible that mechanical equipment used at the Project in Scenario 1 may generate tones that are audible at the surrounding homes; however, this cannot be confirmed due to the lack of specific acoustical data available at this time. If such a tone does exist then the applicable noise standard will be reduced by 5 dBA, as required by the municipal code (see Section 3.2 of this report). To provide a conservative assessment, Scenario 1 will be assessed against the reduced L_{50} standards of 50 dBA during the daytime (7 a.m. to 10 p.m.) and 45 dBA at night (10 p.m. to 7 a.m.). Operational noise associated with Scenario 1 will also be assessed against the General Plan standard of 65 dB L_{dn} .



Each of the five scenarios was analyzed using SoundPLAN noise modeling software. This software takes a number of significant variables into account, including source sound power levels, the interior acoustics and exterior construction of rooms containing noise sources, the distances from sources to receivers, the heights of sources and receivers, ground effects, barrier effects provided by topography, walls or buildings, and reflections of noise off hard surfaces.

The results of the noise modeling for each of the five scenarios are provided as noise contour maps in Appendix II, and are summarized in Table 5-1.

Table 5-1. Estimated Noise Levels Due to Each Operational Scenario

Operational Scenario	Receiver Location: Residential Property to the...	L ₅₀ (1 st /2 nd Floor)	L _{dn} ^a (1 st /2 nd Floor)
Scenario 1, Typical Operations	North	49 dBA / NA	55 dB / NA ^a
	East	38 dBA / 41 dBA	44 dB / 47 dB ^a
	South	46 dBA / 48 dBA	52 dB / 54 dB ^a
	West	38 dBA / 39 dBA	44 dB / 45 dB ^a
Scenario 2, Emergency Generator Test	North	56 dBA / NA	56 dB / NA ^b
	East	50 dBA / 52 dBA	45 dB / 48 dB ^b
	South	57 dBA / 58 dBA	53 dB / 55 dB ^b
	West	48 dBA / 48 dBA	45 dB / 46 dB ^b
Scenario 3, Emergency Generator Operation	North	57 dBA / NA	63 dB / NA ^c
	East	51 dBA / 53 dBA	57 dB / 59 dB ^c
	South	58 dBA / 58 dBA	64 dB / 64 dB ^c
	West	49 dBA / 49 dBA	55 dB / 55 dB ^c
Scenario 4, Chemical Deliveries	North	56 dBA / NA	56 dB / NA ^d
	East	47 dBA / 47 dBA	45 dB / 48 dB ^d
	South	46 dBA / 48 dBA	52 dB / 54 dB ^d
	West	44 dBA / 46 dBA	45 dB / 46 dB ^d
Scenario 5, Fuel Deliveries	North	66 dBA / NA	57 dB / NA ^e
	East	53 dBA / 57 dBA	46 dB / 49 dB ^e
	South	59 dBA / 61 dBA	53 dB / 55 dB ^e
	West	56 dBA / 57 dBA	47 dB / 48 dB ^e
Notes:			
a. Assumes 24-hour operation of the facility.			
b. Assumes 24-hour operation of the facility with testing of the emergency generator during one daytime hour.			
c. Assumes 24-hour operation of the facility and the emergency generator.			
d. Assumes 24-hour operation of the facility with a chemical delivery during one daytime hour.			
e. Assumes 24-hour operation of the facility with a fuel delivery during one daytime hour.			

Table 5-2 summarizes the estimated impacts of the project relative to the City's exterior daytime standard of 50 dBA and nighttime standard of 45 dBA at the nearby residential properties, as well as the City's exterior L_{dn} standard of 65 dB:



Table 5-2. Assessment of Impact for Each Operational Scenario

Operational Scenario	Receiver Location: Residential Property to the...	L ₅₀ (1 st /2 nd Floor)	L _{dn} (1 st /2 nd Floor)
Scenario 1, Typical Operations	North	Complies day / NA Exceeds night / NA	Complies / NA
	East	Complies day / Complies day Complies night / Complies night	Complies / Complies
	South	Complies day / Complies night Exceeds night / Exceeds night	Complies / Complies
	West	Complies day / Complies day Complies night / Complies night	Complies / Complies
Scenario 2, Emergency Generator Test	North	No noise standard	No noise standard
	East	No noise standard	No noise standard
	South	No noise standard	No noise standard
	West	No noise standard	No noise standard
Scenario 3, Emergency Generator Operation	North	No noise standard	No noise standard
	East	No noise standard	No noise standard
	South	No noise standard	No noise standard
	West	No noise standard	No noise standard
Scenario 4, Chemical Deliveries	North	No noise standard	No noise standard
	East	No noise standard	No noise standard
	South	No noise standard	No noise standard
	West	No noise standard	No noise standard
Scenario 5, Fuel Deliveries	North	No noise standard	No noise standard
	East	No noise standard	No noise standard
	South	No noise standard	No noise standard
	West	No noise standard	No noise standard

Referring to Table 5-2, it is anticipated that Scenario 1 (typical day-to-day operations) will comply with the City’s Municipal Code standards at all of the surrounding residential properties during the daytime hours, but will exceed the nighttime standards at residences north and south of the project site. Scenario 2 (emergency generator testing) and Scenario 3 (emergency generator operation) are expected to generate noise levels of up to 58 dBA at the residential properties. Scenario 4 (chemical deliveries) is expected to generate noise levels of up to 56 dBA at the residential properties, and Scenario 5 (fuel deliveries) is expected to generate noise levels of up to 66 dBA at the residential properties. Since the emergency generator testing and operation, as well as both chemical and fuel deliveries, will be short-term and non-continuous, and associated with government and non-government facilities to maintain public health and safety, these operations are exempt from the City municipal ordinance.

Scenario 1 (typical day-to-day operations) is also expected to comply with the interior noise standards at all of the surrounding residential properties during the daytime hours, but will exceed the nighttime standards at residences north and south of the project site. This is based on the assumption that continuous operations produce a constant noise level during the noisiest 30 minutes, and that residential buildings will provide at least 20 dB of exterior-to-interior noise reduction with windows and doors closed.



The estimated future L_{dn} is below the standard of 65 dB for all five of the analyzed scenarios at residential locations.

6 Noise Control Recommendations

The following recommendations are provided to mitigate the noise impacts associated with typical day-to-day operations of the Project as described in Scenario 1, and to reiterate the “typical best practices” noise control measures that were included in the design of the Project. All recommendations are based on the most up-to-date plans and specifications available to Wieland Acoustics at the time of our analysis. It is understood that these are not final plans and are subject to change. Therefore, it is further recommended that the final plans be reviewed by a qualified acoustical consultant to verify compliance with the City’s noise standards and, if necessary, provide updated or additional recommendations to achieve compliance. The estimated noise levels after mitigation are provided as noise contour maps in Appendix III.

1. Noise shall be an important consideration in the procurement of the equipment to be used at the facility. The equipment sound power and sound pressure levels shall not exceed those stated in Table 6-1.
2. A wall shall be constructed around the perimeter of the site and along portions of the driveway as shown in Figure 6-1.
3. All exterior walls of the building shall be of minimum 8”-thick, solid-grouted, concrete masonry unit (CMU) construction. Both the interior and exterior sides of the walls shall be covered with two coats of latex paint or sealer (a clear coating product can be used, if desired, to maintain the aesthetics of the CMU).
4. A parapet wall shall be constructed around the entire roof of the building. The wall shall have a minimum height of 16 inches relative to the finished roof elevation and shall be constructed of CMUs.
5. The removable panels surrounding the entry doors to the ammonia room and the sodium hypochlorite room shall be at least 1-3/4” thick and be covered on both sides with minimum 16 gauge stainless steel sheets. Weather-resistant seals shall be installed around the perimeter of each panel to maintain an airtight seal.
6. All access doors to the pump room and generator room, including the door between the pump room and the generator room, shall be sound-rated assemblies with a minimum sound transmission class (STC) rating of 43 (e.g., Industrial Acoustics Company (IAC) STC 43 Noise Lock door) and shall remain closed when not in use. The door assemblies shall include a manufacturer-approved frame and hardware (perimeter seals, astragal, drop seals, etc.) as necessary to maintain the STC rating for the installed assembly. The perimeter of the door frame shall be sealed to the exterior wall construction with a weather-resistant sealant.
7. Vents to the pump room shall be placed in the walls rather than in the doors, shall be installed as close to the ground as feasible, and shall not exceed 16 square feet in total area. The vents



shall be fitted with acoustical louvers that provide the following minimum octave band sound transmission loss values:

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
6 dB	6 dB	8 dB	10 dB	14 dB	18 dB	16 dB	15 dB

Based on manufacturer’s literature², this can be achieved with 6”-thick Slimshield Quiet-Vent acoustical louvers manufactured by Industrial Acoustics Company (IAC). The perimeter of the louvers shall be sealed airtight to the exterior wall construction with a weather-resistant sealant.

8. The green roof on the building shall provide a minimum dry weight of 23 pounds per square foot, and shall be sealed airtight. Solar tubes and skylights shall not be permitted.
9. All roof hatches shall be constructed of minimum 11 gauge (i.e., 11 gauge or thicker) aluminum or steel and shall incorporate resilient gaskets to provide an airtight seal when closed.
10. The interior side of the roof of the entire building shall consist of an exposed acoustical deck that provides the following minimum octave band sound absorption coefficients:

125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	NRC
0.58	0.99	0.92	0.79	0.43	0.23	0.80

Based on manufacturer’s literature³, this can be achieved with PLB Acoustical, HSB Acoustical, PLN Acoustical, or N-24 Acoustical deck manufactured by Verco Decking, Inc.

11. The interior of the pump room walls shall be lined with a minimum total of 800 square feet of acoustical panels and the interior of the generator room walls shall be lined with a minimum total of 200 square feet of acoustical panels. These panels shall provide the following minimum octave band sound absorption coefficients:

125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	NRC
0.86	0.89	0.93	0.89	0.84	0.77	0.90

Based on manufacturer’s literature³, this can be achieved with Noise-Foil Model NF-I-4-P panels manufactured by Industrial Acoustics Company (IAC). To maximize the effectiveness of the panels, they shall be distributed proportionally over the available wall area. Panels shall not be mounted in locations where they are covered or obscured by equipment cabinets, pipe work, or other solid objects that would provide a barrier between the pumps and the acoustical panels. The panels shall be attached directly to the wall surfaces with a Type A mounting per the manufacturer’s instructions and specifications (this is typically achieved using manufacturer-supplied mounting brackets).

12. The rooftop exhaust fans in the pump room and the generator room shall be fitted with acoustical silencers that provide the following minimum octave band dynamic insertion loss values:

² Wieland Acoustics, Inc. assumes no liability for the accuracy of the manufacturer’s published acoustical performance data.



63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
10 dB	18 dB	31 dB	36 dB	37 dB	28 dB	23 dB	16 dB

Based on manufacturer’s literature³, this can be achieved with 36-FCS-36 acoustical silencers manufactured by Industrial Acoustics Company (IAC). These silencers have a diameter and a length of 36 inches. The silencers shall be located within the pump room and the generator room, and the exhaust of the silencer shall be located at least 27 inches from the entry to the exhaust fan. The duct connecting the silencer to the exhaust fan shall be circular in cross-section, shall transition gradually from a diameter of 36 inches at the silencer to 30 inches at the fan, shall include a radiused elbow, and shall be constructed of minimum 16 gauge steel.

13. The emergency generator exhaust shall be fitted with a silencer that provides the following minimum octave band insertion losses:

63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
33.8	43.4	41.3	40.3	38.2	35.5	38.6	40.6

Based on manufacturer’s literature³, this can be achieved with a model A201-6100 Super Critical Grade cylindrical silencer manufactured by GT Exhaust.

14. The intake and exhaust openings in the generator room walls shall be fitted with silencers, as follows:
- a. **Intake:** Two 64 ft² openings (i.e., 128 ft² total), each fitted with Innovative Metal Industries (IMI) model MVA 1420-36-180 silencers (a 6×6 array of 36 silencer units, each with a 16”×16” cross-section and a length of 23”).
 - b. **Exhaust:** A 113.8 ft² opening fitted with IMI model MVA 1420-36-180 silencers (an 8×8 array of 64 silencer units, each with a 16”×16” cross-section and a length of 23”).
15. Where an above-ground hose, pipe, or conduit (if any) penetrates an exterior wall of the building, the penetration shall be made through a prefabricated split metal sleeve. The hose/pipe/conduit shall float inside the sleeve with a resilient material filling the gap. The gap between the metal sleeve and the wall shall be grouted or packed airtight.
16. All other openings in the exterior of the building (doors, windows, louvers, fan openings, roof hatches, etc.) shall be limited to the number, size, and locations indicated on the referenced drawings.



Table 6-1. Maximum Equipment Sound Levels

Equipment Item	Total Sound Power	Total Sound Pressure Level @ 3 feet
Vertical turbine pump motors ^a	105.0 dBA	94.9 dBA
Chemical metering pumps ^b	77.6 dBA	67.5 dBA
Sodium hypochlorite room exhaust fan	64.9 dBA	54.8 dBA
Pump room exhaust fans ^c	68.4 dBA	58.3 dBA
Generator room exhaust fan	68.4 dBA	58.3 dBA
1,250 kVA transformer	74.9 dBA	64.8 dBA
Generator mechanical noise, 100% load ^d	122.6 dBA	112.5 dBA
Generator mechanical noise, up to 25% load ^e	128.0 dBA	117.9 dBA
Generator open exhaust noise, 100% load ^d	121.3 dBA	111.2 dBA
Generator open exhaust noise, up to 25% load ^e	119.3 dBA	109.2 dBA
Notes: a. Sound level is per vertical turbine pump motor, with up to three (3) vertical turbine pump motors running simultaneously. b. Sound level is per metering pump, with up to two (2) metering pumps running simultaneously. c. Sound level is per pump room exhaust fan, with up to two (2) pump room exhaust fans running simultaneously. d. Sound level during emergency operation. e. Sound level during generator testing.		

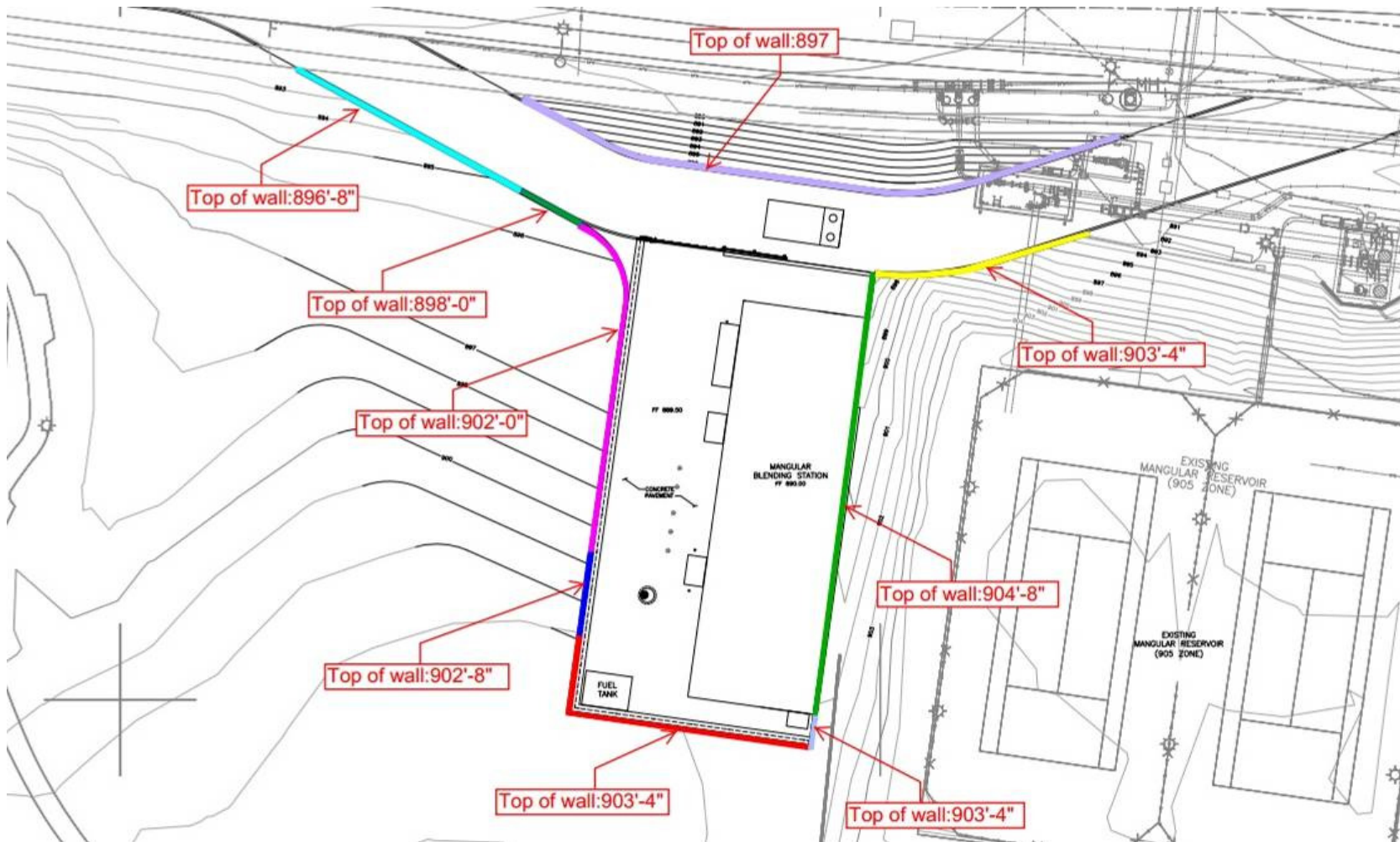


Figure 6-1. Location of Recommended Perimeter Walls



7 Occupational Safety and Health Administration (OSHA)

7.1 OSHA Requirements

The OSHA requirements are based on three levels of employee exposure to noise:

TWA³ is Less Than 85 dBA: The employer has no requirements with regard to employees who are exposed to a TWA that is less than 85 dBA.

TWA is 85 dBA to 90 dBA: If an employee is exposed to a TWA between 85 dBA and 90 dBA, inclusive, the employer is required to do the following:

1. Provide free and appropriate hearing protection. However, the employee is not required to use the protection unless it has been shown that (s)he has experienced a standard threshold shift (hearing loss) as a result of workplace noise exposure. In this case, the employer must ensure that the employee has a selection of alternative hearing protection options, and that the employee uses the protection. The hearing protection must reduce the employee's exposure to less than 85 dBA.
2. Provide a hearing conservation program. The hearing conservation program consists of at least the following elements:
 - a. Monitoring of employee noise exposures. The monitoring is to be repeated whenever there is a change in the workplace or an employee's schedule or duties that might affect his or her TWA or the effectiveness of their hearing protection.
 - b. Audiometric testing. This is to be provided free of charge within 6 months of an employee's first exposure to a TWA of 85 dBA or greater. The audiometric testing is to be repeated at least once a year to determine whether the employee has experienced a standard threshold shift (hearing loss).
 - c. Record keeping. The employer must keep accurate records of all noise exposure monitoring and audiometric testing.
3. Provide a training program. The training program consists of at least the following elements:
 - a. Must be provided at least once a year by the employer to all employees involved in the hearing conservation program (i.e., all employees exposed to a TWA of 85 dB or greater).
 - b. Must inform the employee of the effects of noise on hearing; the various types of personal hearing protection that are available; instructions on selection, fitting, use and care of hearing protectors; and the purpose of audiometric testing.

TWA is Greater Than 90 dBA: If an employee is exposed to a TWA greater than 90 dBA, the employer is required to do the following:

³ Time-Weighted Average Sound Level (TWA): A calculated value that considers the various sound levels an employee is exposed to during the workday, and the duration of those exposures.



1. Implement feasible administrative or engineering controls to reduce the TWA to 90 dBA or less. If such controls fail, or if the controls are found to be infeasible, then the employer must provide free and appropriate hearing protection. The employer must ensure that the employee has a selection of alternative hearing protection options, and that the employee uses the protection. The employer must provide training in the proper use, care and fit of the hearing protection. The hearing protection must reduce the employee's exposure to less than 90 dBA, unless the employee has experienced a standard threshold shift (hearing loss), in which case the hearing protection must reduce the employee's exposure to 85 dBA or less.
2. Provide a hearing conservation program, as described above.
3. Provide a training program, as described above.

7.2 Assessment of OSHA Noise Impacts

Based on the analyses prepared for this study, including the recommended noise mitigation measures, employees may experience noise levels in excess of the OSHA standards inside the pump room and the generator room.

8 Implementation Disclaimer

Wieland Acoustics assumes no responsibility whatsoever for the implementation of the recommendations provided in this report, or for the details of construction or the final noise levels following completion of the project. We are responsible only for the accuracy of our calculations, which are based on the construction elements detailed in this report. No guarantees or assurances are given or implied.

9 References

1. *City of Corona General Plan, Noise Element*. City of Corona. March 17, 2004.
2. *Corona, California, Municipal Code*. (<http://www.amlegal.com>) City of Corona. September 21, 2011.
3. *Project Drawings, Sheets A-1 through A-8, M-1 through M-4, E-2 and E-5*. Provided by HDR, Inc.
4. *Mangular Blending Facility, Draft Preliminary Design Report*. HDR, Inc. April 23, 2012.
5. "20120702172136.pdf" – Acoustical Data for Verco roof decks. Provided by HDR, Inc. July 2, 2012.

APPENDIX I

Noise Measurements

Table I-1. Summary of Ambient Baseline Noise Measurements at 2190 Newton Drive, Corona

Date	Start Time	Average Level, dBA	Maximum Level, dBA	Minimum Level, dBA	Noise Level Exceeded for More Than... (dBA)				Ldn, dB
					1 Min/Hr	5 Min/Hr	15 Min/Hr	30 Min/Hr	
07Aug 14	5:00 PM	57.0	74.8	47.8	64.0	59.3	56.8	54.4	
07Aug 14	6:00 PM	55.8	74.7	47.6	61.8	58.4	56.1	53.7	
07Aug 14	7:00 PM	56.2	76.6	45.1	61.2	58.7	56.7	54.6	
07Aug 14	8:00 PM	55.4	74.7	41.1	62.1	57.9	55.5	53.1	
07Aug 14	9:00 PM	54.2	72.6	39.3	61.3	57.5	54.7	51.2	
07Aug 14	10:00 PM	53.1	73.7	39.9	60.8	56.9	53.7	49.5	
07Aug 14	11:00 PM	51.9	66.1	39.6	58.7	56.2	53.2	49.1	
08Aug 14	12:00 AM	49.7	77.3	38.8	56.8	54.1	48.1	42.5	
08Aug 14	1:00 AM	45.5	60.8	39.0	54.7	50.4	42.6	40.6	
08Aug 14	2:00 AM	46.7	65.0	38.7	55.1	50.2	46.1	41.0	
08Aug 14	3:00 AM	45.2	62.5	38.3	54.9	48.6	41.2	39.7	
08Aug 14	4:00 AM	51.4	70.5	38.4	60.0	56.3	49.6	42.4	
08Aug 14	5:00 AM	56.9	72.3	40.5	63.7	60.0	57.8	55.4	
08Aug 14	6:00 AM	56.8	71.1	38.8	63.2	60.4	57.9	55.7	
08Aug 14	7:00 AM	56.6	73.3	40.6	63.4	59.9	57.5	55.1	
08Aug 14	8:00 AM	56.3	68.5	40.1	62.8	59.5	57.5	55.2	
08Aug 14	9:00 AM	55.4	73.9	39.8	61.5	58.9	56.4	53.3	
08Aug 14	10:00 AM	55.4	67.1	40.9	61.7	58.9	56.6	53.9	
08Aug 14	11:00 AM	55.6	78.1	40.5	62.6	58.7	56.0	53.1	
08Aug 14	12:00 PM	55.6	71.0	42.6	62.3	58.7	56.3	53.9	
08Aug 14	1:00 PM	56.4	71.8	46.6	62.9	59.2	56.8	54.5	
08Aug 14	2:00 PM	58.7	88.9	46.9	63.0	59.4	57.3	55.2	
08Aug 14	3:00 PM	56.7	70.5	46.5	63.5	59.4	57.2	54.9	
08Aug 14	4:00 PM	60.5	72.2	48.9	65.9	64.3	62.0	58.7	59.9
08Aug 14	5:00 PM	57.1	73.7	47.2	63.7	60.6	57.5	54.6	60.0
08Aug 14	6:00 PM	55.8	69.9	47.9	61.6	58.8	56.7	54.5	60.0
08Aug 14	7:00 PM	57.5	76.0	42.3	64.0	59.8	57.5	55.5	60.0
08Aug 14	8:00 PM	55.9	78.6	43.2	62.8	58.7	56.2	53.8	60.0
08Aug 14	9:00 PM	55.5	77.4	41.2	62.6	58.1	55.6	52.7	60.0
08Aug 14	10:00 PM	56.2	84.4	40.2	59.9	57.3	54.9	51.1	60.4
08Aug 14	11:00 PM	52.2	77.7	39.3	59.0	56.0	52.7	47.0	60.4
09Aug 14	12:00 AM	49.3	61.9	38.8	56.9	54.6	49.9	43.0	60.4
09Aug 14	1:00 AM	47.6	67.4	38.6	55.7	52.8	45.0	41.0	60.4
09Aug 14	2:00 AM	48.3	71.2	38.5	55.9	52.2	47.4	42.4	60.4
09Aug 14	3:00 AM	45.7	67.6	38.5	54.8	48.8	41.4	39.9	60.5
09Aug 14	4:00 AM	46.1	69.7	38.6	54.6	47.9	40.6	39.6	60.3
09Aug 14	5:00 AM	50.1	76.6	38.6	57.6	53.7	45.3	41.1	59.6
09Aug 14	6:00 AM	51.0	70.5	39.6	58.5	55.5	50.7	45.4	58.8
09Aug 14	7:00 AM	53.6	70.9	40.1	61.0	57.6	54.4	49.6	58.8
09Aug 14	8:00 AM	54.6	74.1	40.6	61.3	58.2	55.0	51.3	58.7

Table I-1, cont. Summary of Ambient Baseline Noise Measurements at 2190 Newton Drive, Corona

Date	Start Time	Average Level, dBA	Maximum Level, dBA	Minimum Level, dBA	Noise Level Exceeded for More Than... (dBA)				Ldn, dB
					1 Min/Hr	5 Min/Hr	15 Min/Hr	30 Min/Hr	
09Aug 14	9:00 AM	56.2	78.5	40.8	63.3	58.7	56.0	53.3	58.7
09Aug 14	10:00 AM	56.3	75.8	41.3	63.7	59.4	56.5	53.7	58.8
09Aug 14	11:00 AM	56.4	77.7	41.5	62.6	59.8	57.2	54.8	58.8
09Aug 14	12:00 PM	57.4	79.8	46.0	62.3	59.3	57.3	55.1	58.8
09Aug 14	1:00 PM	58.1	87.8	46.0	63.5	59.6	57.3	55.2	58.9
09Aug 14	2:00 PM	58.8	87.1	45.8	65.7	60.1	57.3	55.0	58.9
09Aug 14	3:00 PM	56.6	67.8	46.1	63.3	59.9	57.3	55.1	58.9
09Aug 14	4:00 PM	56.9	76.3	45.6	63.1	59.3	57.0	55.0	58.7
09Aug 14	5:00 PM	57.2	74.8	45.4	63.7	60.3	57.4	55.3	58.7
09Aug 14	6:00 PM	55.6	75.0	45.2	61.0	58.1	56.2	53.9	58.7
09Aug 14	7:00 PM	55.4	78.9	41.5	60.4	58.3	56.1	53.8	58.7
09Aug 14	8:00 PM	54.1	73.6	41.3	60.5	57.5	54.7	51.8	58.6
09Aug 14	9:00 PM	54.8	76.1	40.5	60.9	57.8	55.5	52.6	58.6
09Aug 14	10:00 PM	53.4	67.4	40.0	60.1	57.7	54.8	49.9	58.1
09Aug 14	11:00 PM	52.0	74.3	39.3	59.4	56.4	52.7	46.9	58.1
10Aug 14	12:00 AM	50.9	72.9	38.8	58.8	55.1	49.7	42.7	58.2
10Aug 14	1:00 AM	47.8	66.8	38.8	56.3	53.1	45.4	41.6	58.2
10Aug 14	2:00 AM	48.0	75.1	38.8	55.3	49.6	46.0	41.6	58.2
10Aug 14	3:00 AM	45.7	68.0	38.4	54.4	47.3	41.6	40.3	58.2
10Aug 14	4:00 AM	43.8	61.0	38.2	54.0	45.8	40.4	39.4	58.1
10Aug 14	5:00 AM	45.2	62.1	38.4	54.6	49.5	41.8	40.3	57.9
10Aug 14	6:00 AM	49.6	67.2	39.2	58.5	53.4	46.5	43.4	57.8
10Aug 14	7:00 AM	51.2	64.3	39.7	58.9	56.2	52.3	45.5	57.8
10Aug 14	8:00 AM	53.0	70.7	39.9	58.9	56.6	53.9	50.3	57.8
10Aug 14	9:00 AM	54.8	73.4	39.9	61.6	58.3	55.6	52.7	57.7
10Aug 14	10:00 AM	54.9	69.2	39.6	61.4	58.2	56.1	53.3	57.7
10Aug 14	11:00 AM	56.2	77.5	40.9	62.9	59.2	56.5	54.0	57.7
10Aug 14	12:00 PM	57.6	76.8	46.1	64.1	59.9	57.5	55.7	57.7
10Aug 14	1:00 PM	57.8	89.2	44.9	62.7	58.7	56.4	54.1	57.7
10Aug 14	2:00 PM	57.5	87.2	45.5	64.0	59.4	56.7	54.2	57.6
10Aug 14	3:00 PM	55.2	71.2	45.8	60.6	58.0	56.0	53.9	57.6
10Aug 14	4:00 PM	56.0	77.3	45.2	62.6	58.5	56.1	53.6	57.6
10Aug 14	5:00 PM	55.5	72.9	44.9	62.1	58.4	56.0	53.6	57.5
10Aug 14	6:00 PM	54.8	66.5	46.2	60.7	58.0	55.9	53.5	57.5
10Aug 14	7:00 PM	56.1	80.5	46.7	61.6	58.3	56.1	54.1	57.5
10Aug 14	8:00 PM	54.1	72.9	40.7	60.6	57.5	54.9	51.7	57.5
10Aug 14	9:00 PM	52.4	67.5	39.8	59.3	56.3	53.4	49.1	57.5
10Aug 14	10:00 PM	52.0	68.3	39.7	61.4	56.2	51.5	45.5	57.3
10Aug 14	11:00 PM	50.1	70.6	39.3	59.0	54.0	47.4	42.1	57.1
11Aug 14	12:00 AM	48.0	68.2	39.0	56.5	52.4	44.8	41.2	56.9

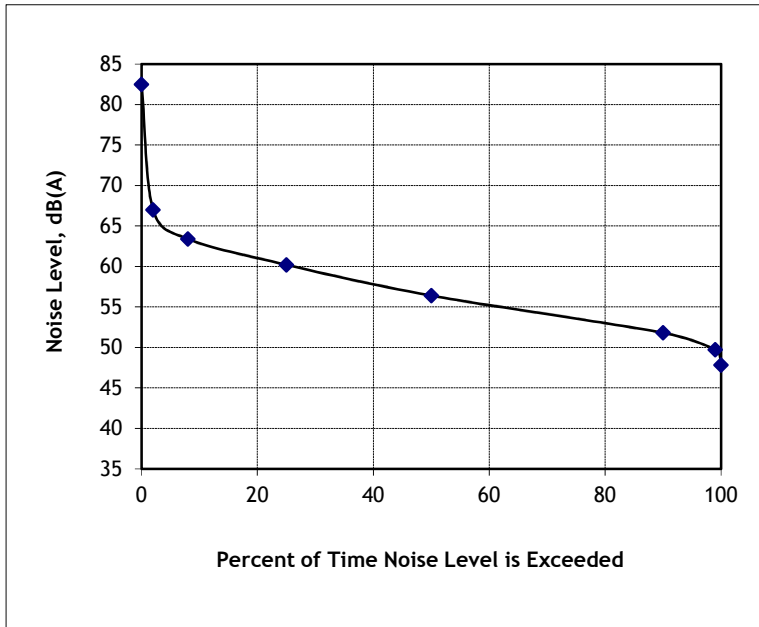
Table I-1, cont. Summary of Ambient Baseline Noise Measurements at 2190 Newton Drive, Corona

Date	Start Time	Average Level, dBA	Maximum Level, dBA	Minimum Level, dBA	Noise Level Exceeded for More Than... (dBA)				Ldn, dB
					1 Min/Hr	5 Min/Hr	15 Min/Hr	30 Min/Hr	
11Aug 14	1:00 AM	47.9	69.9	38.9	55.9	51.2	42.6	40.5	56.9
11Aug 14	2:00 AM	48.2	81.9	39.0	52.4	46.9	43.8	40.9	56.9
11Aug 14	3:00 AM	45.5	72.1	39.2	54.1	47.3	42.5	41.0	56.9
11Aug 14	4:00 AM	51.8	70.0	39.3	60.0	57.0	51.6	43.7	57.3
11Aug 14	5:00 AM	57.9	73.9	40.2	64.7	60.8	58.4	56.5	58.9
11Aug 14	6:00 AM	57.5	70.9	41.4	63.2	60.2	58.2	56.5	59.9
11Aug 14	7:00 AM	58.6	74.7	42.0	64.1	60.8	58.9	57.3	60.0
11Aug 14	8:00 AM	56.8	74.0	40.7	63.7	60.0	57.1	54.7	60.1
11Aug 14	9:00 AM	56.0	76.1	40.0	62.6	59.1	56.7	54.1	60.1
11Aug 14	10:00 AM	55.0	74.0	40.0	62.2	58.7	55.7	52.6	60.1
11Aug 14	11:00 AM	57.7	85.3	40.9	64.2	59.5	56.3	53.4	60.1
11Aug 14	12:00 PM	56.0	80.8	45.8	62.8	58.7	55.8	53.2	60.1
11Aug 14	1:00 PM	55.5	74.2	46.5	61.7	58.4	55.9	53.4	60.0
11Aug 14	2:00 PM	57.8	89.4	46.2	62.5	59.4	57.0	54.9	60.0
11Aug 14	3:00 PM	55.5	68.9	47.3	61.0	58.5	56.5	54.4	60.1

Table I-2. Noise Survey

Project: Mangalar Blending Facility
 Position: Front yard of 2211 Mangalar
 Date: August 7, 2014
 Time: Noted
 Noise Source: Ambient traffic; park activities
 SLM Height: 5'
 LD 820 S/N: 1632
 LD CAL200
 Calibrator S/N: 2916
 Operator: Cynthia Bordash

	Measurement Period		
	3:27 PM to 3:58 PM	to	to
n*	Ln	Ln	Ln
2	67.0		
8	63.4		
25	60.2		
50	56.4		
90	51.8		
99	49.7		
Leq	60.4		
Lmax	82.5		
Lmin	47.8		

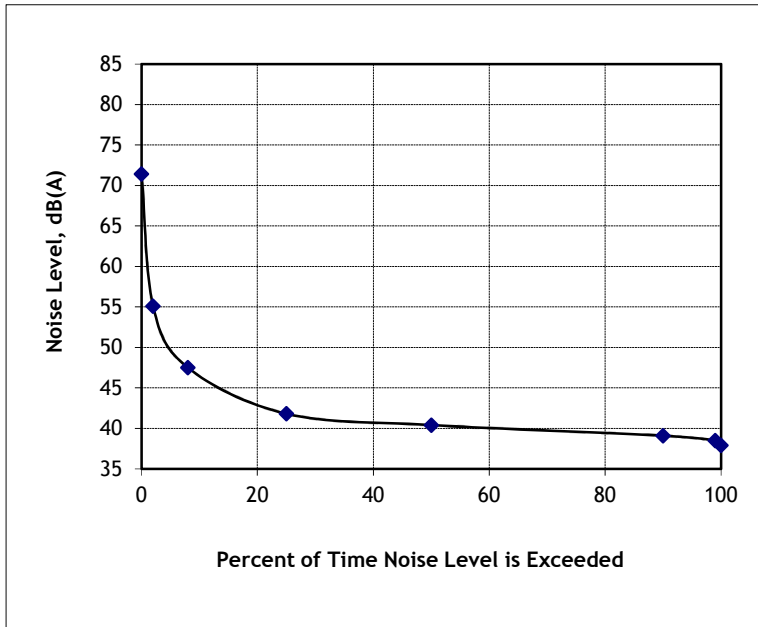


* Leq is the average sound level during the measurement period.
 Ln is the sound level exceeded n% of the time during the measurement period.
 Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

Table I-3. Noise Survey

Project: Mangalar Blending Facility
 Position: Front yard of 2211 Mangalar
 Date: August 8, 2014
 Time: Noted
 Noise Source: Ambient traffic
 SLM Height: 5'
 LD 820 S/N: 1632
 LD CAL200
 Calibrator S/N: 2916
 Operator: Cynthia Bordash

	Measurement Period		
	2:41 AM to 3:11 AM	to	to
n*	Ln	Ln	Ln
2	55.1		
8	47.5		
25	41.8		
50	40.4		
90	39.1		
99	38.5		
Leq	48.2		
Lmax	71.4		
Lmin	37.9		

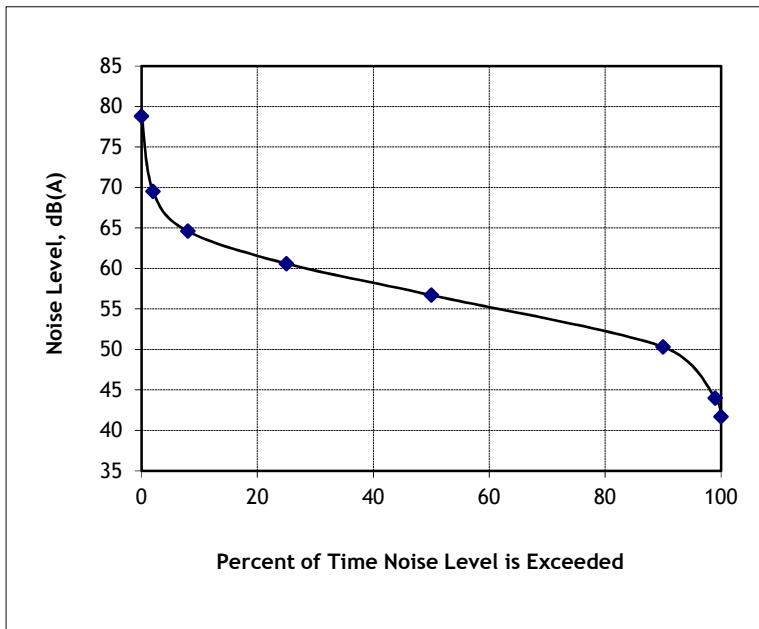


* Leq is the average sound level during the measurement period.
 Ln is the sound level exceeded n% of the time during the measurement period.
 Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

Table I-4. Noise Survey

Project: Manglar Blending Facility
 Position: Front yard of 2211 Mangular
 Date: August 9, 2014
 Time: Noted
 Noise Source: Ambient traffic; park activities
 SLM Height: 5'
 LD 820 S/N: 1632
 LD CAL200
 Calibrator S/N: 2916
 Operator: Cynthia Bordash

	Measurement Period		
	2:33 PM to 3:06 PM	to	to
n*	Ln	Ln	Ln
2	69.5		
8	64.6		
25	60.6		
50	56.7		
90	50.3		
99	44.0		
Leq	60.9		
Lmax	78.8		
Lmin	41.7		

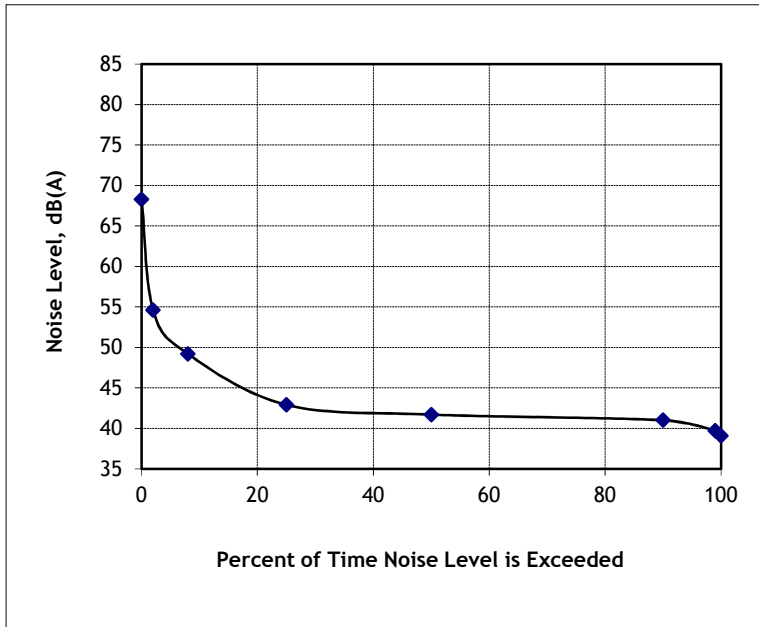


* Leq is the average sound level during the measurement period.
 Ln is the sound level exceeded n% of the time during the measurement period.
 Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

Table I-5. Noise Survey

Project: Manglar Blending Facility
 Position: Front yard of 2211 Mangular
 Date: August 10, 2014
 Time: Noted
 Noise Source: Ambient traffic
 SLM Height: 5'
 LD 820 S/N: 1632
 LD CAL200
 Calibrator S/N: 2916
 Operator: Cynthia Bordash

	Measurement Period		
	2:39 AM to 3:19 AM	to	to
n*	Ln	Ln	Ln
2	54.6		
8	49.2		
25	42.9		
50	41.7		
90	41.0		
99	39.7		
Leq	46.6		
Lmax	68.3		
Lmin	39.1		



* Leq is the average sound level during the measurement period.
 Ln is the sound level exceeded n% of the time during the measurement period.
 Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

Table I-6. Summary of Ambient Baseline Noise Measurements at 1425 Potomac Drive, Corona

Date	Start Time	Average Level, dBA	Maximum Level, dBA	Minimum Level, dBA	Noise Level Exceeded for More Than... (dBA)				Ldn, dB
					1 Min/Hr	5 Min/Hr	15 Min/Hr	30 Min/Hr	
07Aug 14	5:00 PM	51.6	63.4	48.4	56.1	53.7	51.9	50.8	
07Aug 14	6:00 PM	52.3	66.4	49.4	55.4	53.6	52.5	51.8	
07Aug 14	7:00 PM	52.6	72.6	48.7	56.9	54.1	52.3	51.4	
07Aug 14	8:00 PM	51.2	65.8	48.1	54.8	52.7	51.7	51.2	
07Aug 14	9:00 PM	48.5	64.2	42.1	54.0	50.2	48.6	47.6	
07Aug 14	10:00 PM	48.6	68.8	46.2	51.6	49.1	48.1	47.6	
07Aug 14	11:00 PM	48.9	64.5	46.9	52.3	49.6	48.8	48.4	
08Aug 14	12:00 AM	48.6	55.6	47.7	50.0	49.3	48.8	48.5	
08Aug 14	1:00 AM	49.7	68.2	48.3	50.9	50.4	49.8	49.5	
08Aug 14	2:00 AM	51.6	62.9	49.7	53.0	52.8	52.3	51.5	
08Aug 14	3:00 AM	52.8	56.2	51.3	54.0	53.8	53.5	52.9	
08Aug 14	4:00 AM	52.8	58.4	50.8	54.0	53.8	53.4	52.8	
08Aug 14	5:00 AM	52.1	60.3	50.5	53.9	53.0	52.6	52.2	
08Aug 14	6:00 AM	49.7	59.1	47.9	52.5	51.1	50.1	49.4	
08Aug 14	7:00 AM	49.2	58.8	47.2	53.4	51.0	49.3	48.6	
08Aug 14	8:00 AM	49.2	67.9	47.0	53.6	50.6	49.0	48.4	
08Aug 14	9:00 AM	49.0	60.9	46.8	53.6	50.9	48.9	48.2	
08Aug 14	10:00 AM	48.8	61.3	46.3	53.1	50.5	48.9	48.2	
08Aug 14	11:00 AM	49.7	69.6	45.3	56.5	51.4	48.8	47.7	
08Aug 14	12:00 PM	51.0	66.3	47.1	56.6	53.0	50.8	49.5	
08Aug 14	1:00 PM	52.6	70.0	47.4	59.4	55.5	52.1	50.5	
08Aug 14	2:00 PM	51.8	68.6	47.5	57.2	54.5	51.9	50.5	
08Aug 14	3:00 PM	51.6	70.8	47.3	56.5	52.4	50.6	49.6	
08Aug 14	4:00 PM	55.9	71.0	47.9	63.6	58.0	55.5	54.0	57.4
08Aug 14	5:00 PM	57.5	70.6	47.9	67.5	63.1	52.9	50.1	57.5
08Aug 14	6:00 PM	50.1	62.8	47.7	54.6	51.9	50.2	49.5	57.5
08Aug 14	7:00 PM	51.4	68.4	48.2	58.1	53.1	50.7	49.8	57.5
08Aug 14	8:00 PM	50.0	63.9	46.3	54.4	51.5	49.9	49.4	57.5
08Aug 14	9:00 PM	50.3	66.5	48.0	55.0	50.8	49.5	48.8	57.5
08Aug 14	10:00 PM	49.5	64.9	44.7	54.0	50.9	49.5	48.7	57.5
08Aug 14	11:00 PM	49.6	61.8	47.9	51.9	50.9	50.4	49.2	57.6
09Aug 14	12:00 AM	51.2	54.5	49.4	52.9	52.6	51.8	50.9	57.7
09Aug 14	1:00 AM	53.0	57.8	52.3	54.0	53.8	53.2	52.7	58.1
09Aug 14	2:00 AM	53.4	58.8	53.1	54.1	53.9	53.8	53.5	58.3
09Aug 14	3:00 AM	52.9	57.1	52.3	54.0	53.8	53.3	52.8	58.3
09Aug 14	4:00 AM	52.3	55.8	51.5	53.5	52.9	52.7	52.4	58.2
09Aug 14	5:00 AM	51.5	60.8	50.0	53.0	52.7	52.0	51.3	58.2
09Aug 14	6:00 AM	51.8	60.8	48.7	53.0	52.8	52.4	51.8	58.3
09Aug 14	7:00 AM	48.1	56.0	46.1	51.4	49.6	48.5	47.7	58.3
09Aug 14	8:00 AM	49.0	63.1	46.8	53.8	50.6	48.9	48.1	58.3

Table I-6, cont. Summary of Ambient Baseline Noise Measurements at 1425 Potomac Drive, Corona

Date	Start Time	Average Level, dBA	Maximum Level, dBA	Minimum Level, dBA	Noise Level Exceeded for More Than... (dBA)				Ldn, dB
					1 Min/Hr	5 Min/Hr	15 Min/Hr	30 Min/Hr	
09Aug 14	9:00 AM	48.9	62.7	46.7	52.9	50.5	49.0	48.4	58.3
09Aug 14	10:00 AM	51.6	69.7	46.5	58.0	53.2	50.1	48.8	58.3
09Aug 14	11:00 AM	52.5	68.8	47.1	60.7	55.6	51.5	49.6	58.4
09Aug 14	12:00 PM	51.7	70.0	47.0	57.7	53.7	50.6	49.6	58.4
09Aug 14	1:00 PM	52.6	69.7	46.9	60.1	53.9	50.7	49.4	58.4
09Aug 14	2:00 PM	55.5	78.1	47.0	60.1	55.6	52.9	51.6	58.4
09Aug 14	3:00 PM	53.6	66.2	50.4	58.4	55.7	53.7	52.6	58.4
09Aug 14	4:00 PM	53.0	69.1	50.2	58.4	55.0	52.6	51.7	58.4
09Aug 14	5:00 PM	53.2	68.7	47.5	60.8	55.5	52.0	51.2	58.3
09Aug 14	6:00 PM	52.0	68.8	47.7	59.9	53.9	50.5	49.6	58.3
09Aug 14	7:00 PM	50.6	71.9	48.1	55.6	51.2	49.9	49.2	58.3
09Aug 14	8:00 PM	49.2	59.8	44.4	53.6	50.6	49.5	48.7	58.3
09Aug 14	9:00 PM	49.4	60.0	47.9	53.2	50.4	49.2	48.7	58.3
09Aug 14	10:00 PM	50.0	71.9	48.0	52.7	50.3	49.5	48.9	58.3
09Aug 14	11:00 PM	51.7	58.8	49.3	53.9	53.0	52.2	51.5	58.5
10Aug 14	12:00 AM	53.2	62.6	48.9	55.0	54.7	53.9	53.4	58.7
10Aug 14	1:00 AM	48.2	58.1	47.1	50.5	49.3	48.6	47.9	58.3
10Aug 14	2:00 AM	47.6	58.7	47.1	48.7	48.0	47.8	47.5	57.9
10Aug 14	3:00 AM	48.6	52.6	47.6	50.0	49.8	49.1	48.6	57.5
10Aug 14	4:00 AM	51.1	53.3	49.6	52.0	51.9	51.6	51.2	57.4
10Aug 14	5:00 AM	51.3	53.8	49.6	53.5	52.9	52.3	51.1	57.3
10Aug 14	6:00 AM	53.4	59.7	51.8	54.8	54.0	53.7	53.4	57.6
10Aug 14	7:00 AM	48.3	56.8	46.3	51.8	50.9	48.5	47.6	57.6
10Aug 14	8:00 AM	48.3	60.3	46.1	53.0	49.8	48.4	47.7	57.6
10Aug 14	9:00 AM	49.5	66.8	46.5	55.4	51.4	48.8	47.9	57.6
10Aug 14	10:00 AM	49.8	66.8	46.5	56.2	50.9	48.9	48.0	57.5
10Aug 14	11:00 AM	49.1	66.0	46.5	54.4	51.2	48.9	47.9	57.5
10Aug 14	12:00 PM	51.0	66.2	47.0	57.8	52.7	50.0	49.0	57.5
10Aug 14	1:00 PM	50.4	64.1	46.7	56.1	52.9	50.3	49.0	57.5
10Aug 14	2:00 PM	51.0	65.4	46.7	58.5	53.1	50.1	48.9	57.4
10Aug 14	3:00 PM	48.8	59.5	46.4	53.9	50.5	48.8	48.0	57.4
10Aug 14	4:00 PM	49.5	66.1	46.8	54.7	51.0	49.0	48.4	57.3
10Aug 14	5:00 PM	49.9	67.5	46.9	55.1	51.1	49.4	48.5	57.3
10Aug 14	6:00 PM	49.6	58.8	47.3	53.8	51.5	49.9	49.0	57.3
10Aug 14	7:00 PM	51.1	67.6	47.7	56.4	52.1	50.3	49.5	57.3
10Aug 14	8:00 PM	49.7	67.6	47.5	53.4	50.8	49.4	48.6	57.3
10Aug 14	9:00 PM	49.2	64.1	47.4	53.6	49.8	48.8	48.2	57.3
10Aug 14	10:00 PM	50.3	66.0	47.5	57.6	50.9	48.8	48.0	57.3
10Aug 14	11:00 PM	48.0	55.7	47.4	50.8	48.8	47.9	47.6	57.0
11Aug 14	12:00 AM	47.9	59.7	47.3	50.0	48.5	47.9	47.6	56.4

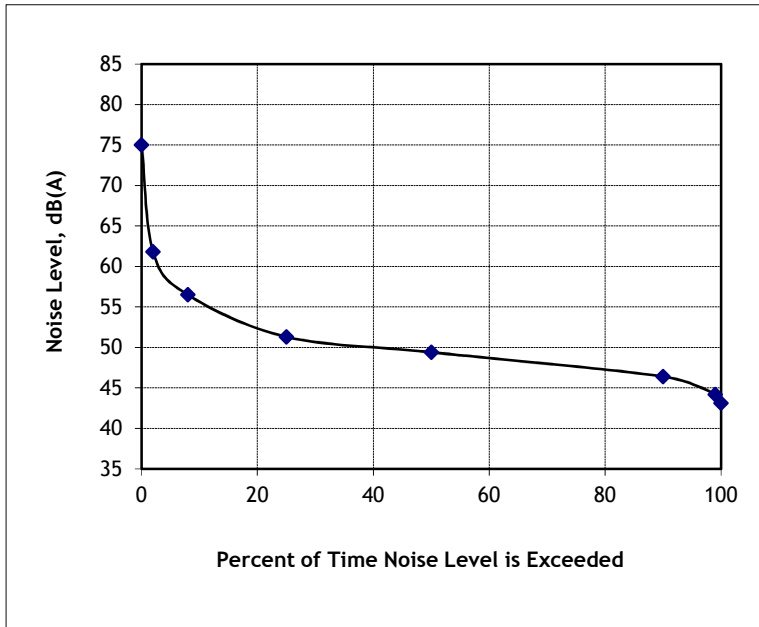
Table I-6, cont. Summary of Ambient Baseline Noise Measurements at 1425 Potomac Drive, Corona

Date	Start Time	Average Level, dBA	Maximum Level, dBA	Minimum Level, dBA	Noise Level Exceeded for More Than... (dBA)				Ldn, dB
					1 Min/Hr	5 Min/Hr	15 Min/Hr	30 Min/Hr	
11Aug 14	1:00 AM	47.8	57.8	47.3	49.7	48.6	47.9	47.6	56.4
11Aug 14	2:00 AM	47.7	55.2	47.4	48.4	48.0	47.8	47.5	56.4
11Aug 14	3:00 AM	48.3	58.1	47.5	50.6	49.0	48.6	48.0	56.4
11Aug 14	4:00 AM	48.8	58.9	47.6	51.2	49.8	48.9	48.5	56.2
11Aug 14	5:00 AM	51.9	61.1	49.0	54.6	53.0	52.5	51.8	56.2
11Aug 14	6:00 AM	52.9	59.3	47.7	55.5	54.4	53.5	52.7	56.1
11Aug 14	7:00 AM	49.9	62.7	45.4	54.5	51.5	49.9	49.1	56.2
11Aug 14	8:00 AM	50.3	70.7	44.0	55.6	51.9	49.3	48.0	56.2
11Aug 14	9:00 AM	51.9	68.7	43.9	62.3	52.8	49.4	48.4	56.2
11Aug 14	10:00 AM	48.5	59.5	46.6	52.6	49.9	48.6	47.8	56.2
11Aug 14	11:00 AM	51.0	67.0	46.7	55.6	52.0	51.0	50.5	56.2
11Aug 14	12:00 PM	51.5	62.4	49.9	55.5	52.9	51.6	50.9	56.2
11Aug 14	1:00 PM	50.5	63.6	47.3	54.6	52.3	50.9	49.6	56.2
11Aug 14	2:00 PM	50.1	60.6	47.6	53.5	51.7	50.5	49.6	56.2
11Aug 14	3:00 PM	49.4	59.9	47.1	53.0	50.9	49.6	48.8	56.2

Table I-7. Noise Survey

Project: Manglar Blending Facility
 Position: Front yard of 2276 Patriot Way
 Date: August 7, 2014
 Time: Noted
 Noise Source: Ambient traffic; park activities
 SLM Height: 5'
 LD 820 S/N: 1632
 LD CAL200
 Calibrator S/N: 2916
 Operator: Cynthia Bordash

	Measurement Period		
	2:46 PM to 3:18 PM	to	to
n*	Ln	Ln	Ln
2	61.8		
8	56.5		
25	51.3		
50	49.4		
90	46.4		
99	44.2		
Leq	53.4		
Lmax	75.0		
Lmin	43.1		

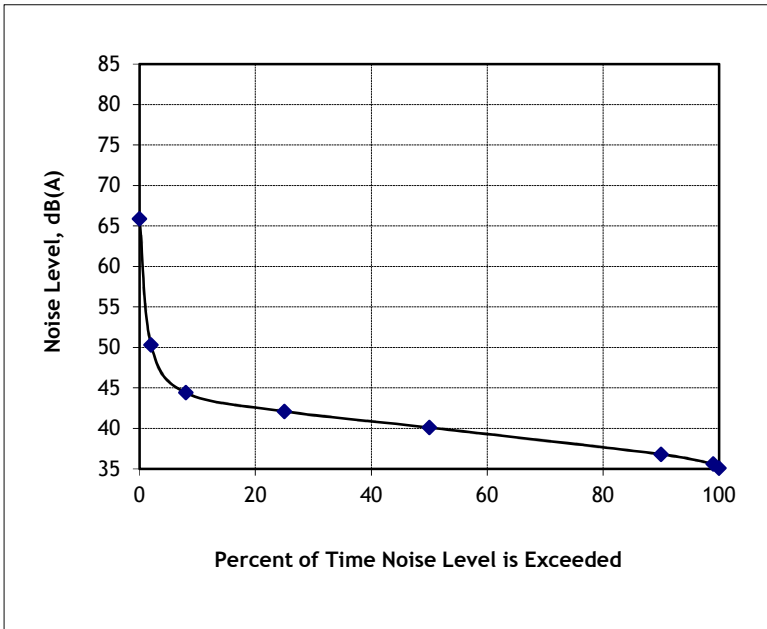


* Leq is the average sound level during the measurement period.
 Ln is the sound level exceeded n% of the time during the measurement period.
 Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

Table I-8. Noise Survey

Project: Manglar Blending Facility
 Position: Front yard of 2276 Patriot Way
 Date: August 8, 2014
 Time: Noted
 Noise Source: Ambient traffic
 SLM Height: 5'
 LD 820 S/N: 1632
 LD CAL200
 Calibrator S/N: 2916
 Operator: Cynthia Bordash

	Measurement Period		
	1:58 AM to 2:28 AM	to	to
n*	Ln	Ln	Ln
2	50.3		
8	44.4		
25	42.1		
50	40.1		
90	36.8		
99	35.6		
Leq	43.5		
Lmax	65.9		
Lmin	35.1		

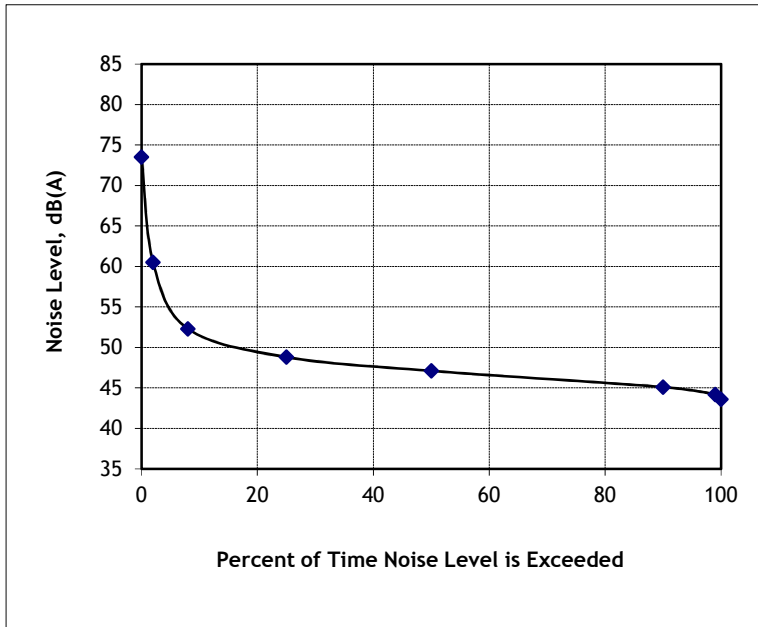


* Leq is the average sound level during the measurement period.
 Ln is the sound level exceeded n% of the time during the measurement period.
 Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

Table I-9. Noise Survey

Project: Manglar Blending Facility
 Position: Front yard of 2276 Patriot Way
 Date: August 9, 2014
 Time: Noted
 Noise Source: Ambient traffic; park activities
 SLM Height: 5'
 LD 820 S/N: 1632
 LD CAL200
 Calibrator S/N: 2916
 Operator: Cynthia Bordash

	Measurement Period		
	3:24 PM to 3:45 PM	to	to
n*	Ln	Ln	Ln
2	60.5		
8	52.3		
25	48.8		
50	47.1		
90	45.1		
99	44.2		
Leq	52.3		
Lmax	73.5		
Lmin	43.6		

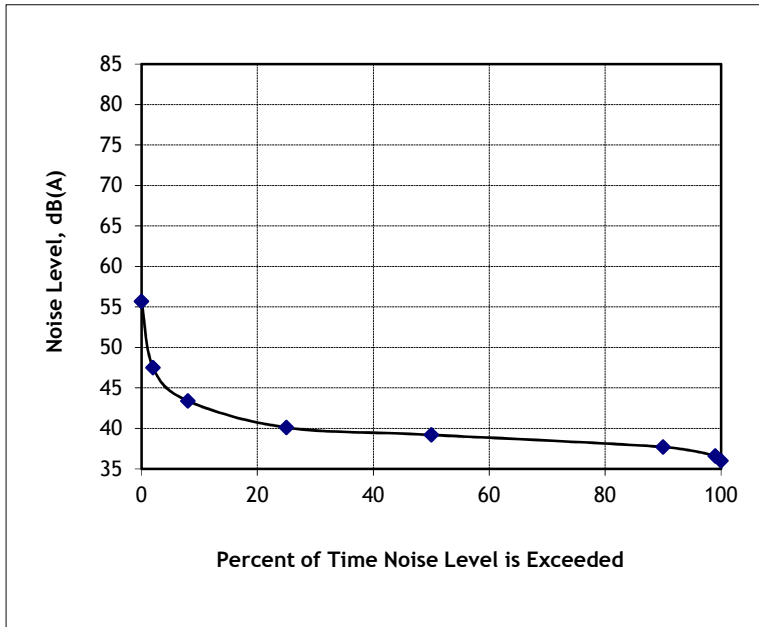


* Leq is the average sound level during the measurement period.
 Ln is the sound level exceeded n% of the time during the measurement period.
 Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

Table I-10. Noise Survey

Project: Manglar Blending Facility
 Position: Front yard of 2276 Patriot Way
 Date: August 10, 2014
 Time: Noted
 Noise Source: Ambient traffic
 SLM Height: 5'
 LD 820 S/N: 1632
 LD CAL200
 Calibrator S/N: 2916
 Operator: Cynthia Bordash

	Measurement Period		
	1:58 AM to 2:28 AM	to	to
n*	Ln	Ln	Ln
2	47.5		
8	43.4		
25	40.1		
50	39.2		
90	37.7		
99	36.6		
Leq	41.0		
Lmax	55.7		
Lmin	36.0		

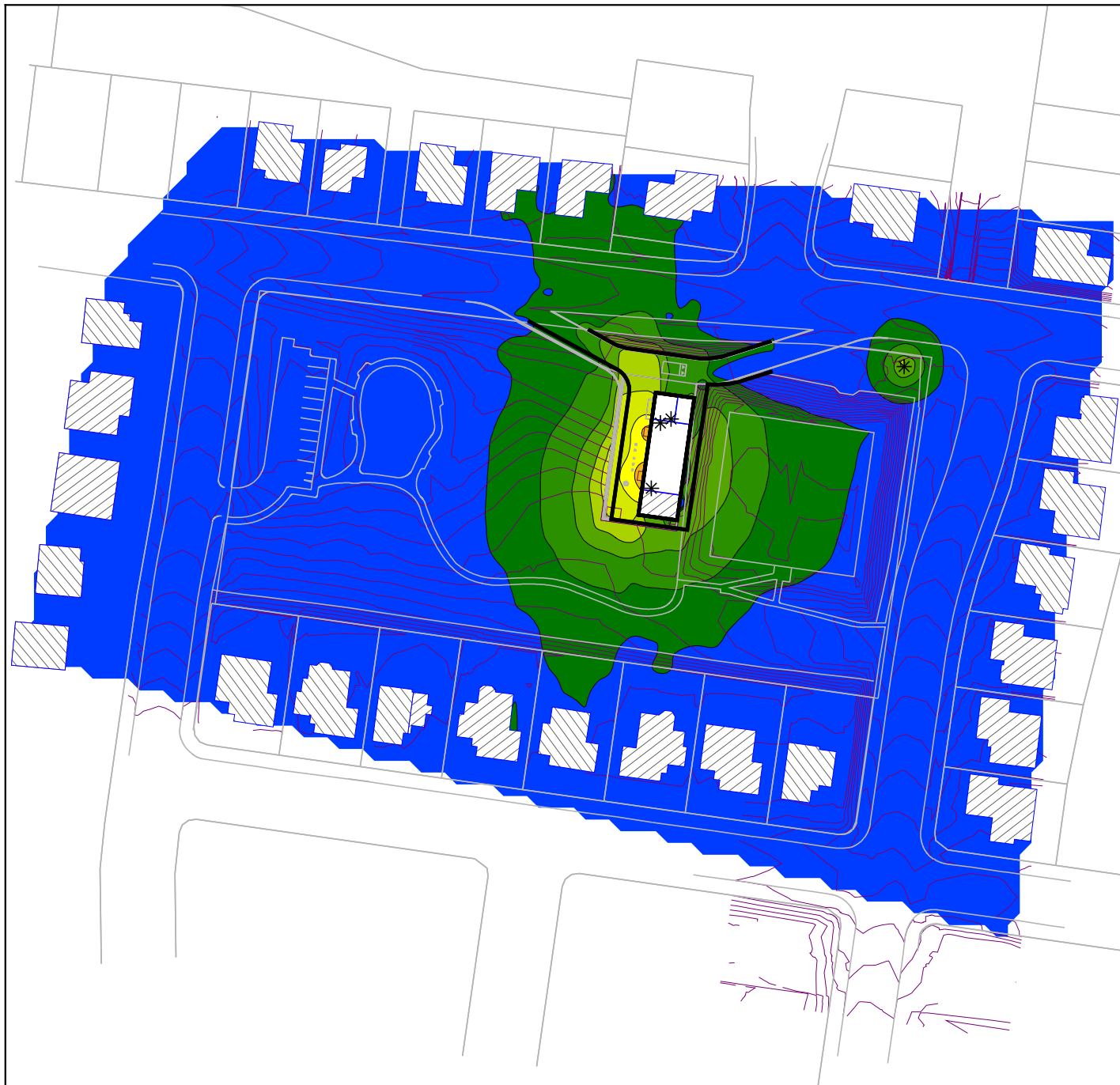


* Leq is the average sound level during the measurement period.
 Ln is the sound level exceeded n% of the time during the measurement period.
 Lmax and Lmin are the maximum and minimum sound levels during the measurement period.

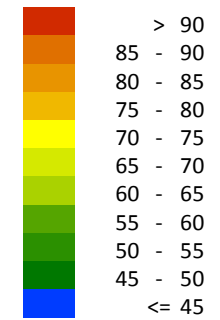
APPENDIX II

Operational Noise Analyses for the Project as Designed

**Figure II-1.
Estimated Noise Level
at Height of 5' Above
Ground Due to Typical
Operations, As Designed**

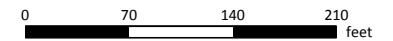


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

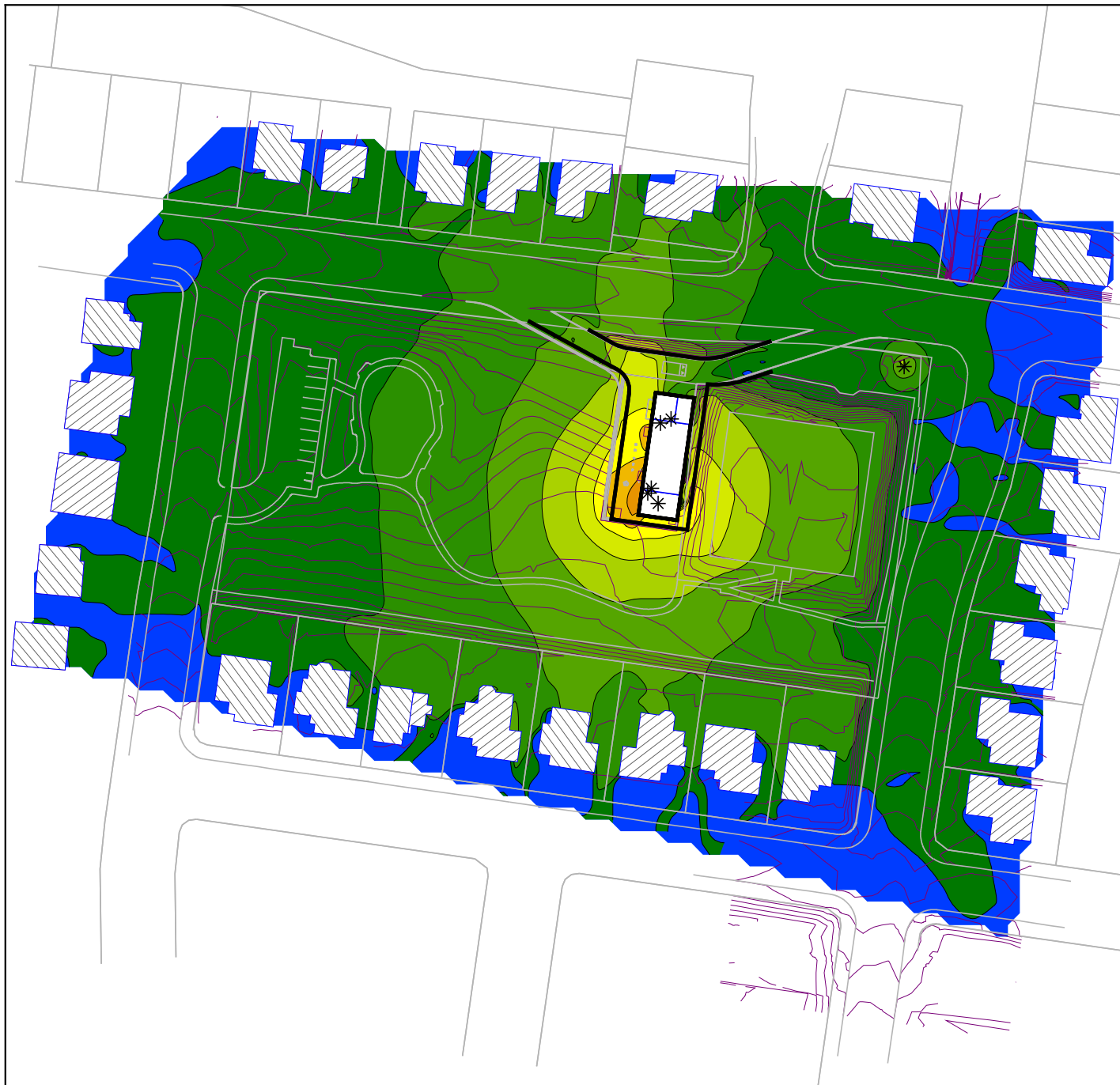


Calculation Date: February 21, 2015

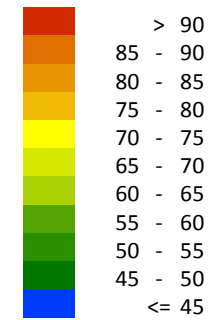


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**Figure II-2.
Estimated Noise Level
at Height of 5' Above
Ground Due to Emergency
Generator Test, As Designed**

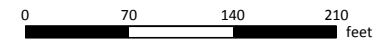


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

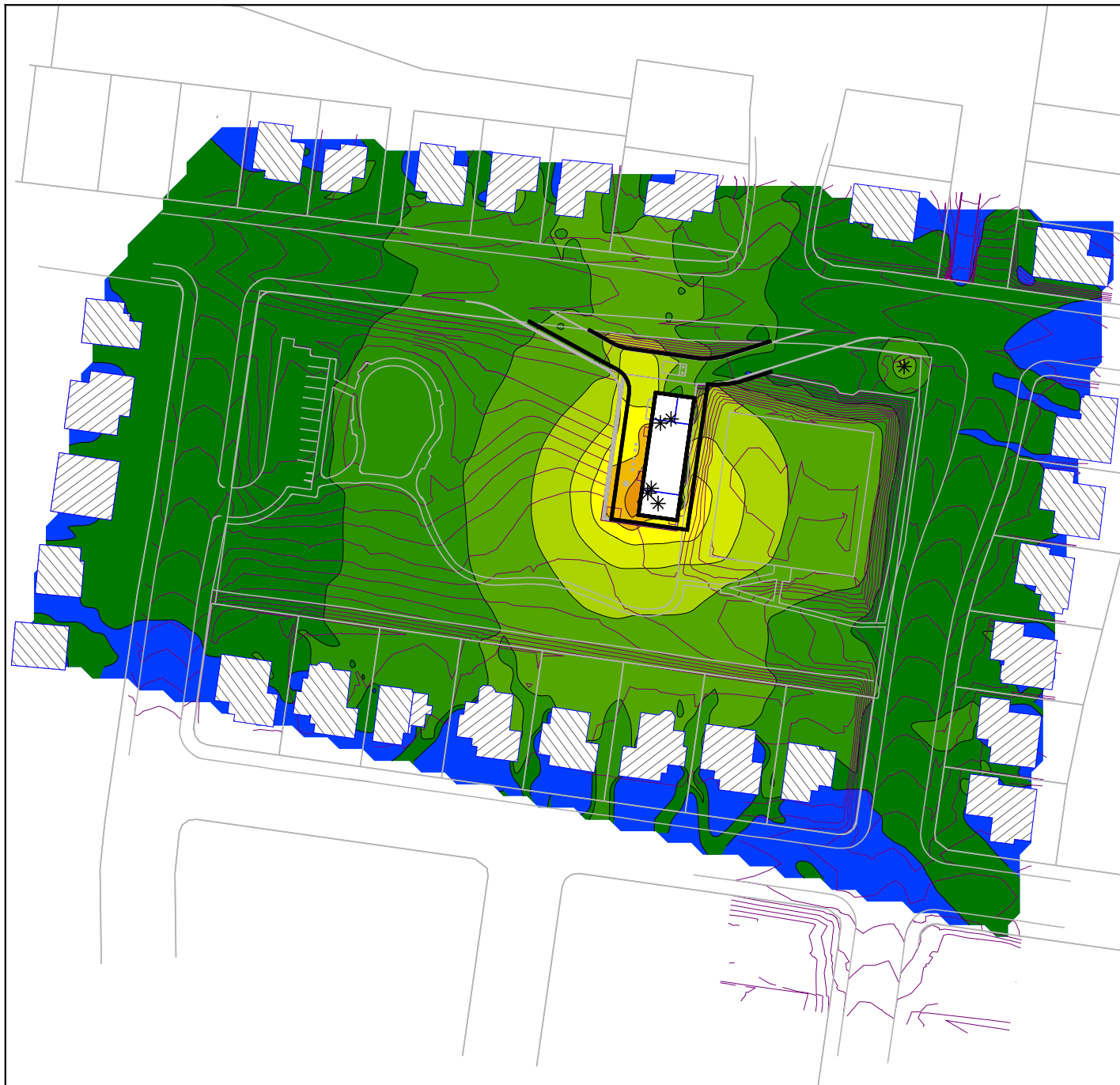


Calculation Date: February 21, 2015

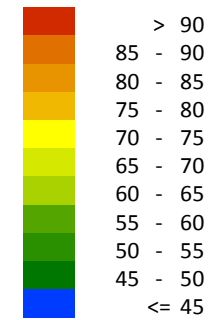


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**Figure II-3.
Estimated Noise Level
at Height of 5' Above
Ground Due to Emergency
Generator Operations,
As Designed**

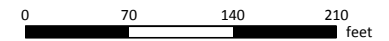


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

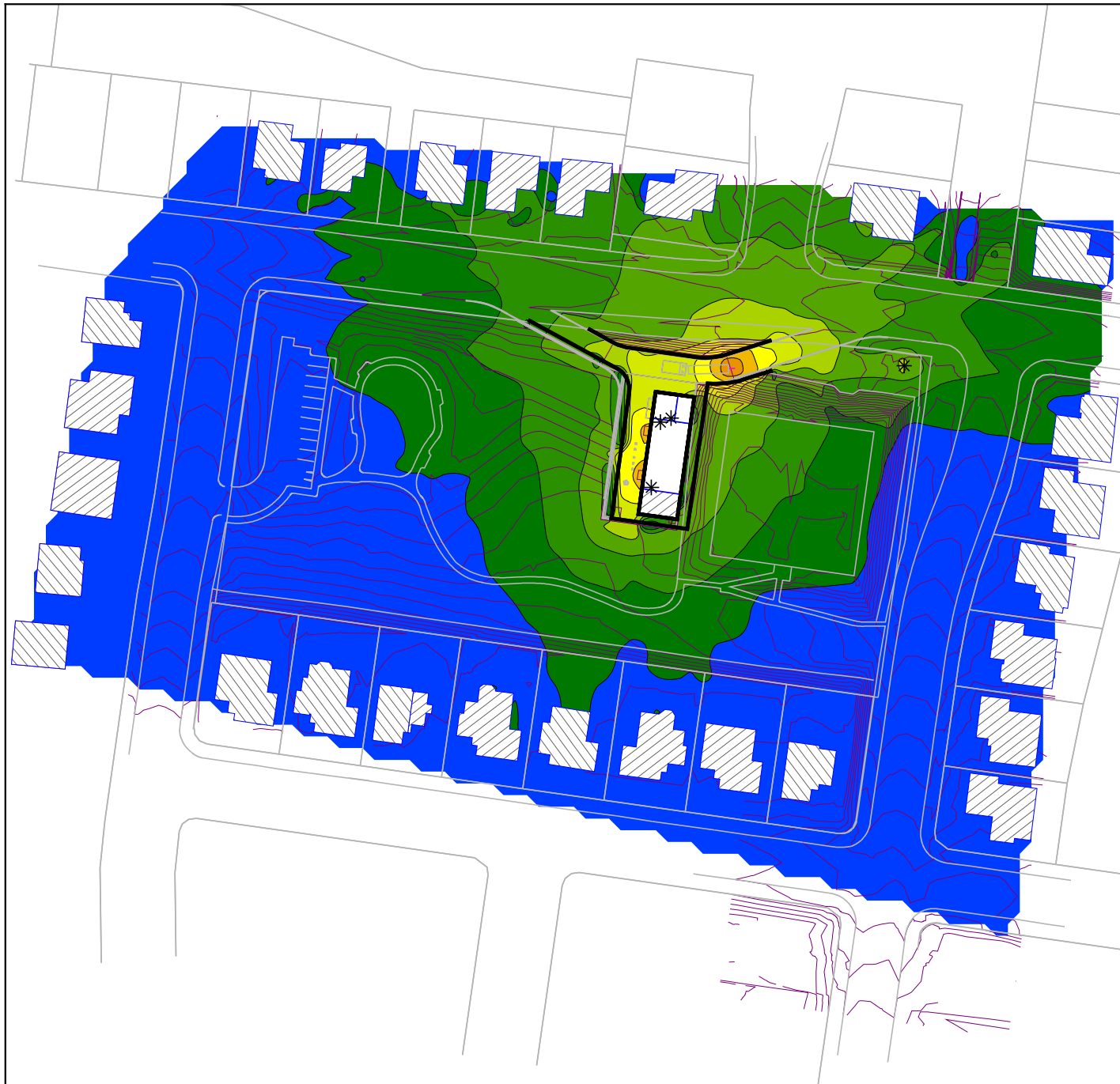


Calculation Date: February 21, 2015

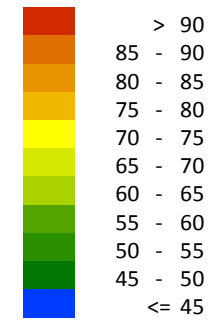


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**Figure II-4.
Estimated Noise Level
at Height of 5' Above
Ground Due to Chemical
Deliveries, As Designed**

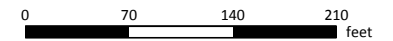


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

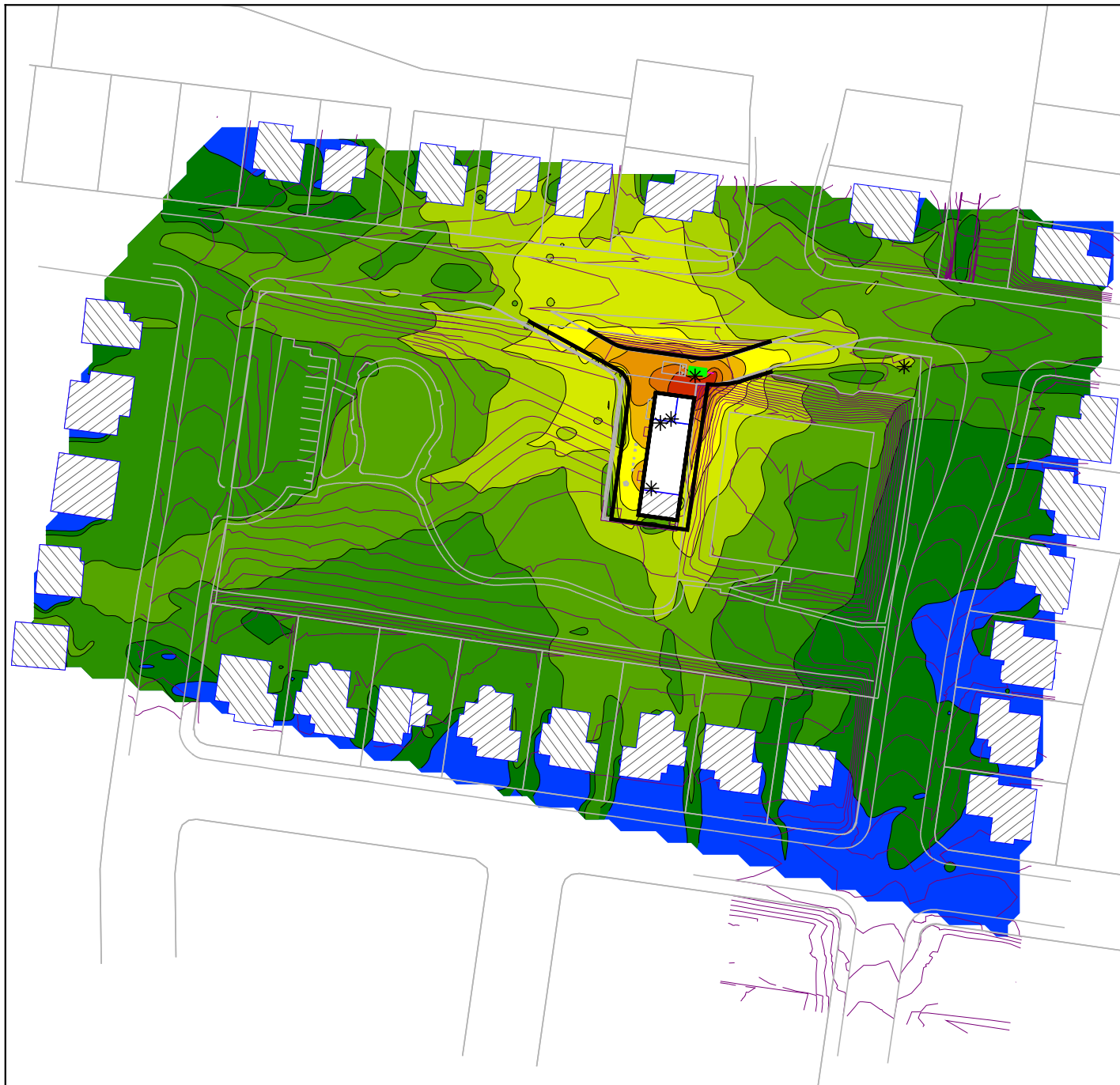


Calculation Date: March 3, 2015

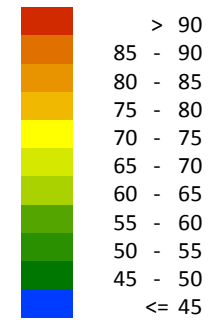


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**Figure II-5.
Estimated Noise Level
at Height of 5' Above
Ground Due to Fuel
Delivery, As Designed**

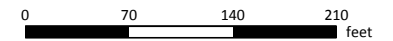


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

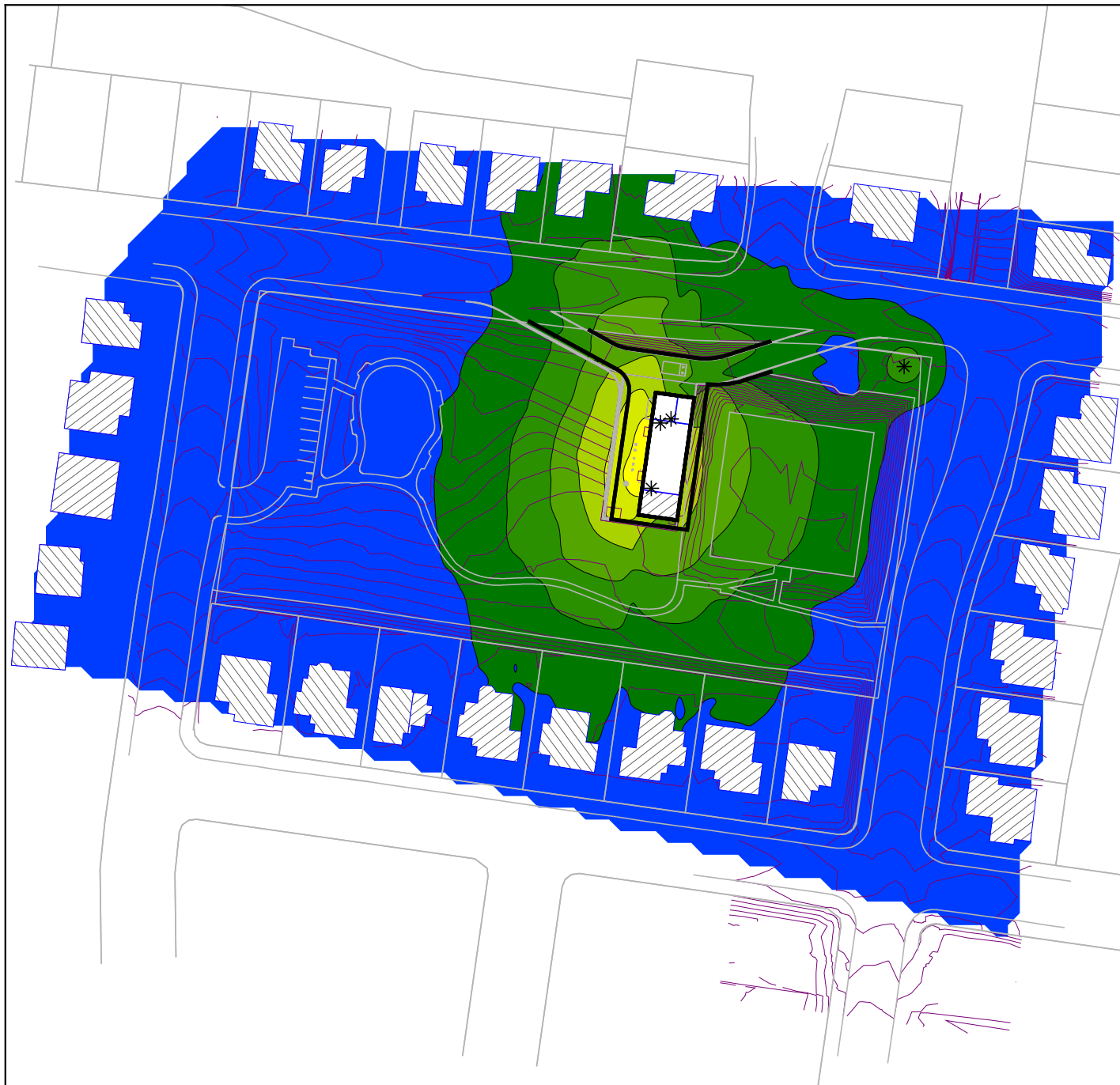


Calculation Date: January 14, 2016

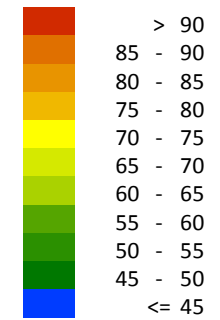


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**Figure II-6.
Estimated Noise Level
at Height of 15' Above
Ground Due to Typical
Operations, As Designed**

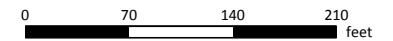


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

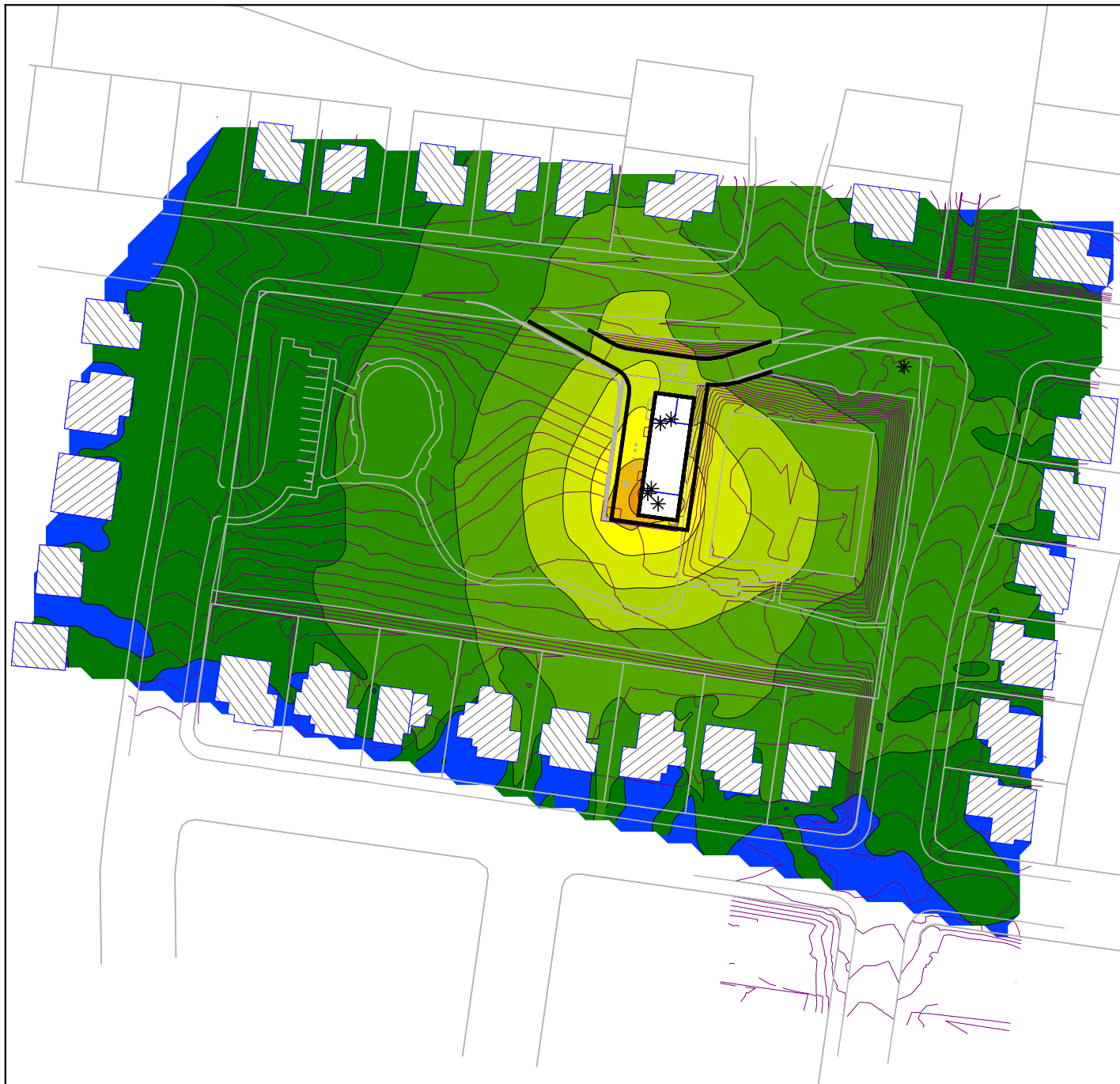


Calculation Date: February 24, 2015

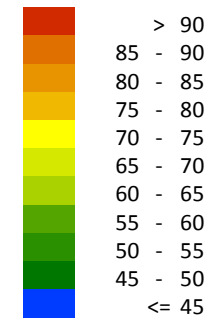


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**Figure II-7.
Estimated Noise Level
at Height of 15' Above
Ground Due to Emergency
Generator Test, As Designed**

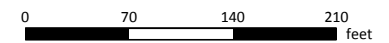


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

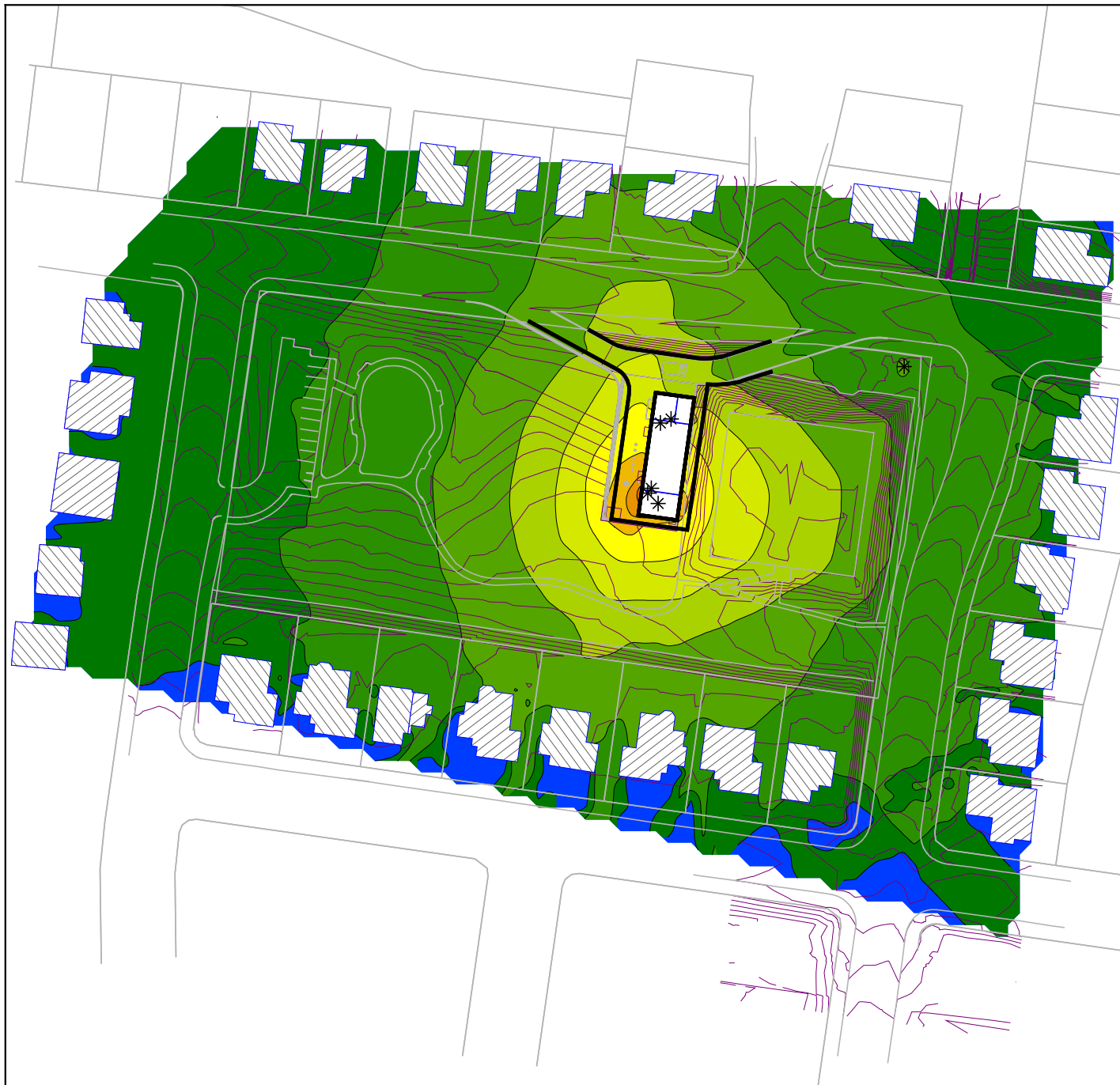


Calculation Date: February 24, 2015

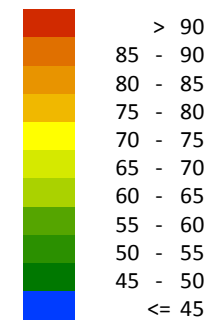


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**Figure II-8.
Estimated Noise Level
at Height of 15' Above
Ground Due to Emergency
Generator Operations,
As Designed**

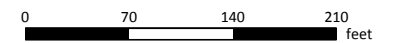


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

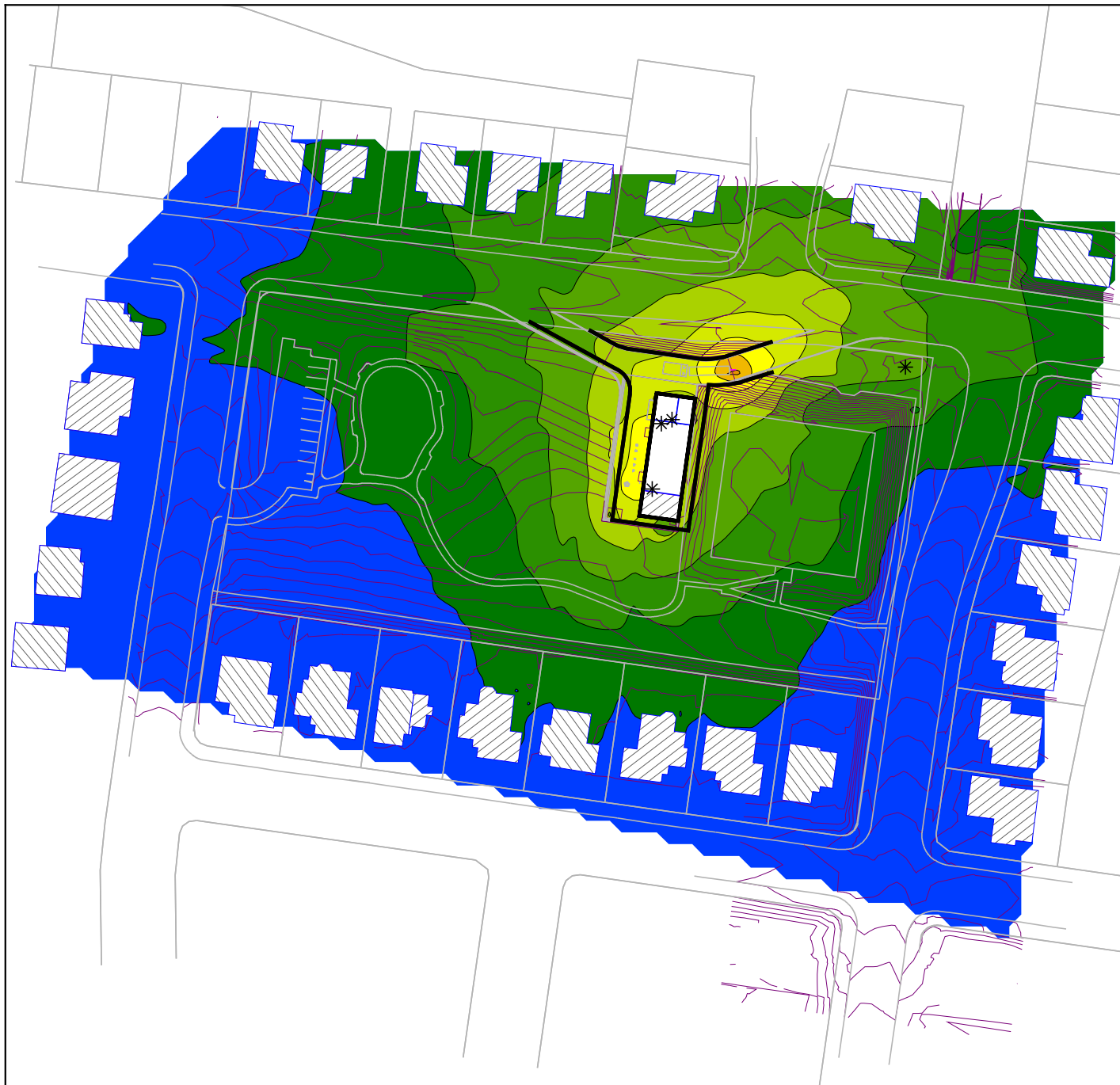


Calculation Date: February 24, 2015

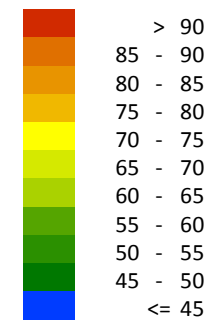


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Figure II-9.
Estimated Noise Level
at Height of 15' Above
Ground Due to Chemical
Deliveries, As Designed

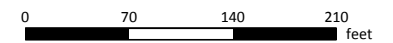


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

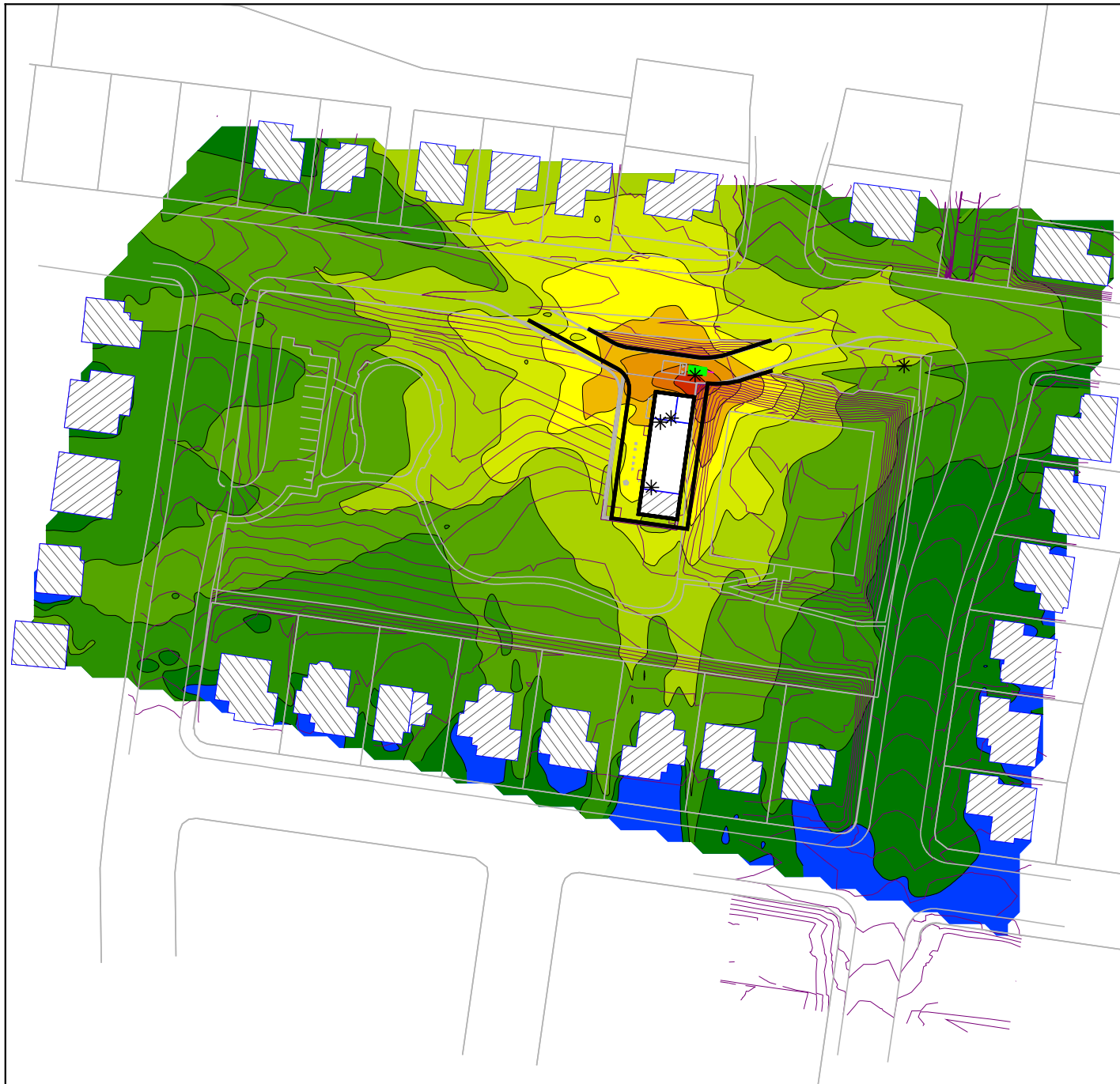


Calculation Date: March 3, 2015

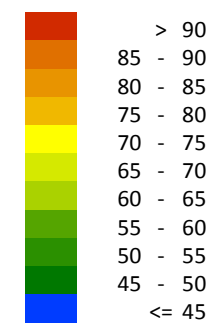


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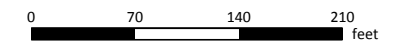
**Figure II-10.
Estimated Noise Level
at Height of 15' Above
Ground Due to Fuel
Delivery, As Designed**



Noise Level, dBA



- Signs and symbols
- Elevation line
 - Homes/Buildings
 - Master Site Plan
 - Industrial building
 - Point source
 - Wall

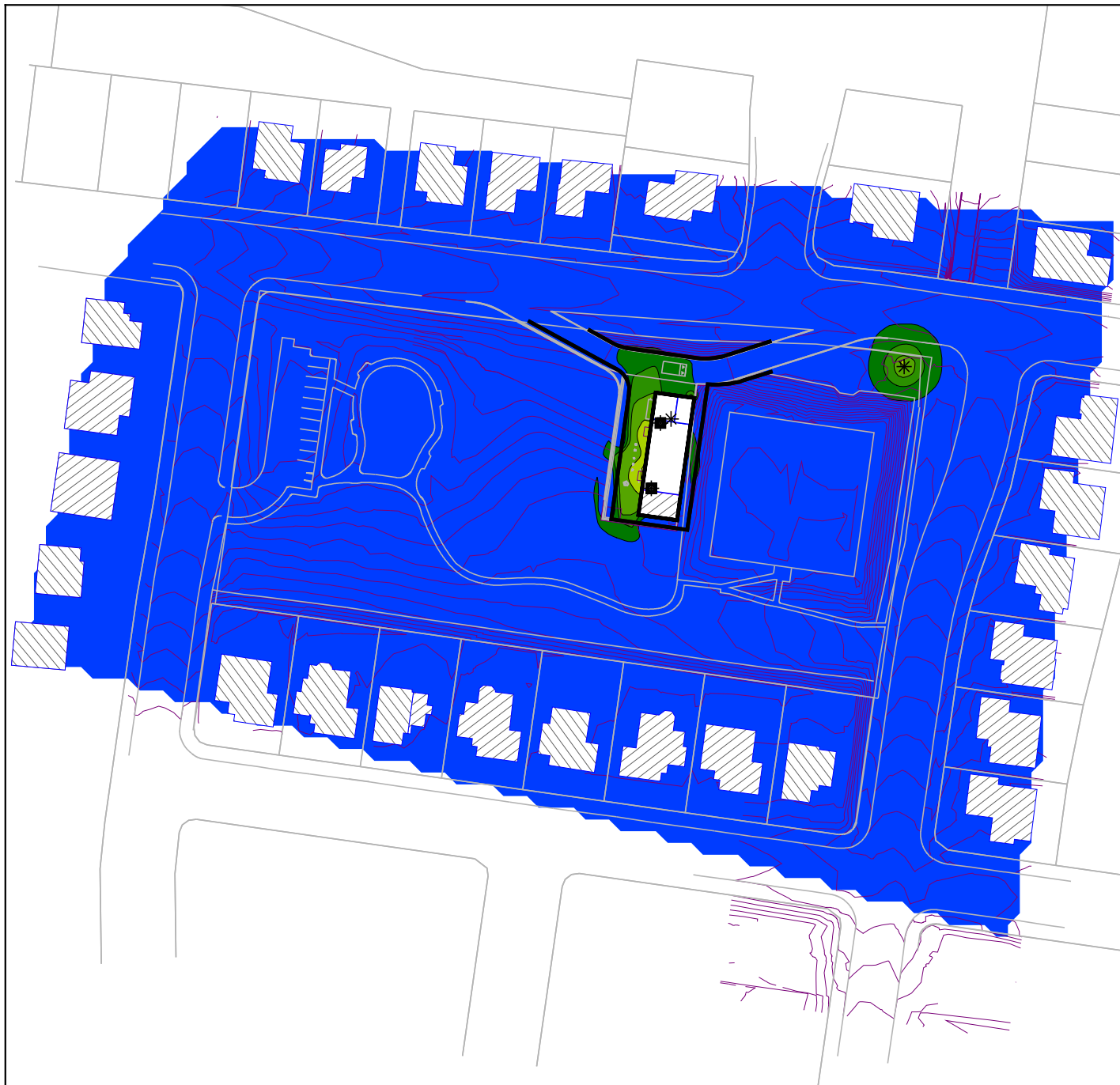


Calculation Date: January 14, 2016

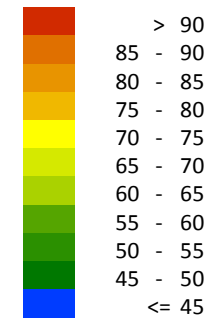
APPENDIX III

Operational Noise Analysis for the Project with Mitigation

**Figure III-1.
Estimated Noise Level
at Height of 5' Above
Ground Due to Typical
Operations, Mitigated**

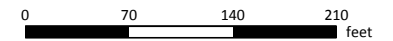


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

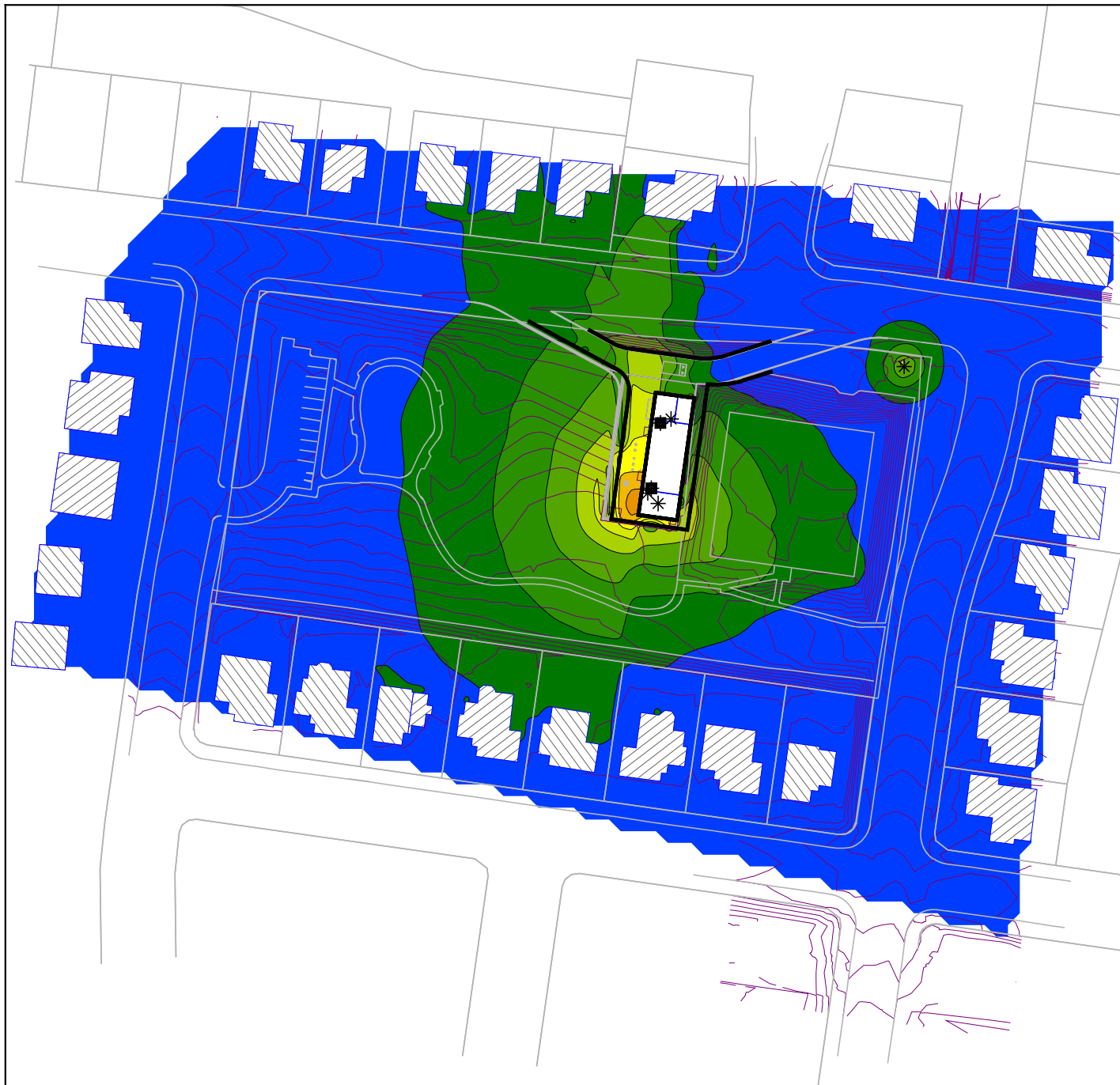


Calculation Date: April 2, 2015

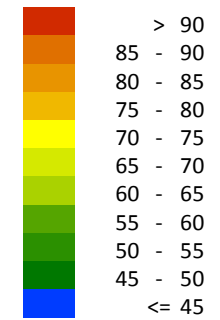


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**Figure III-2.
Estimated Noise Level
at Height of 5' Above
Ground Due to Emergency
Generator Test, Mitigated**

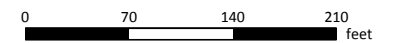


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

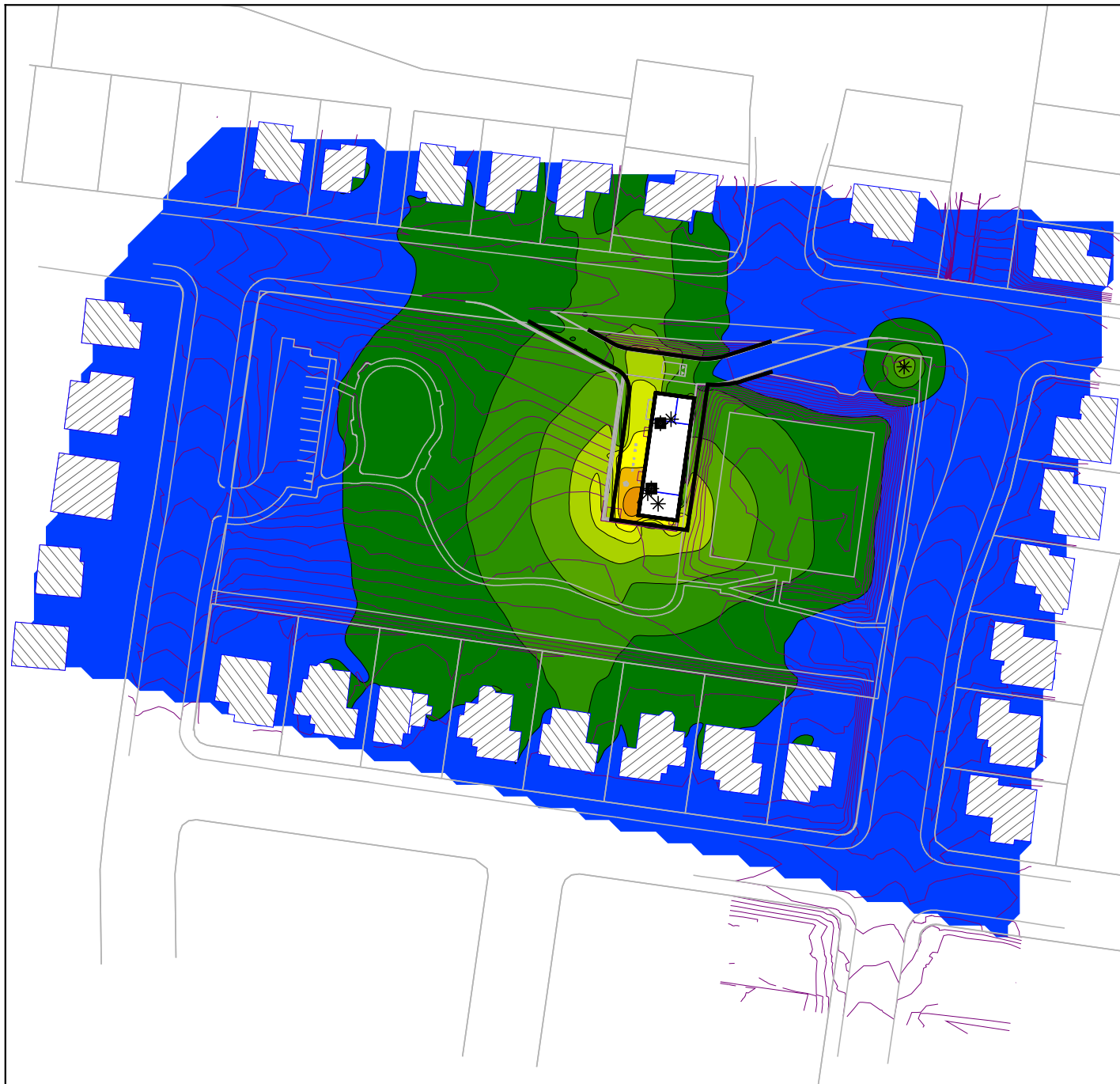


Calculation Date: April 13, 2015

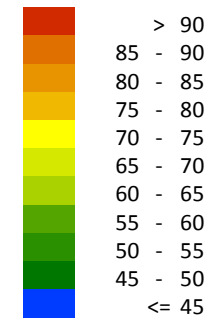


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**Figure III-3.
Estimated Noise Level
at Height of 5' Above
Ground Due to Emergency
Generator Operation,
Mitigated**

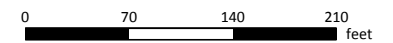


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

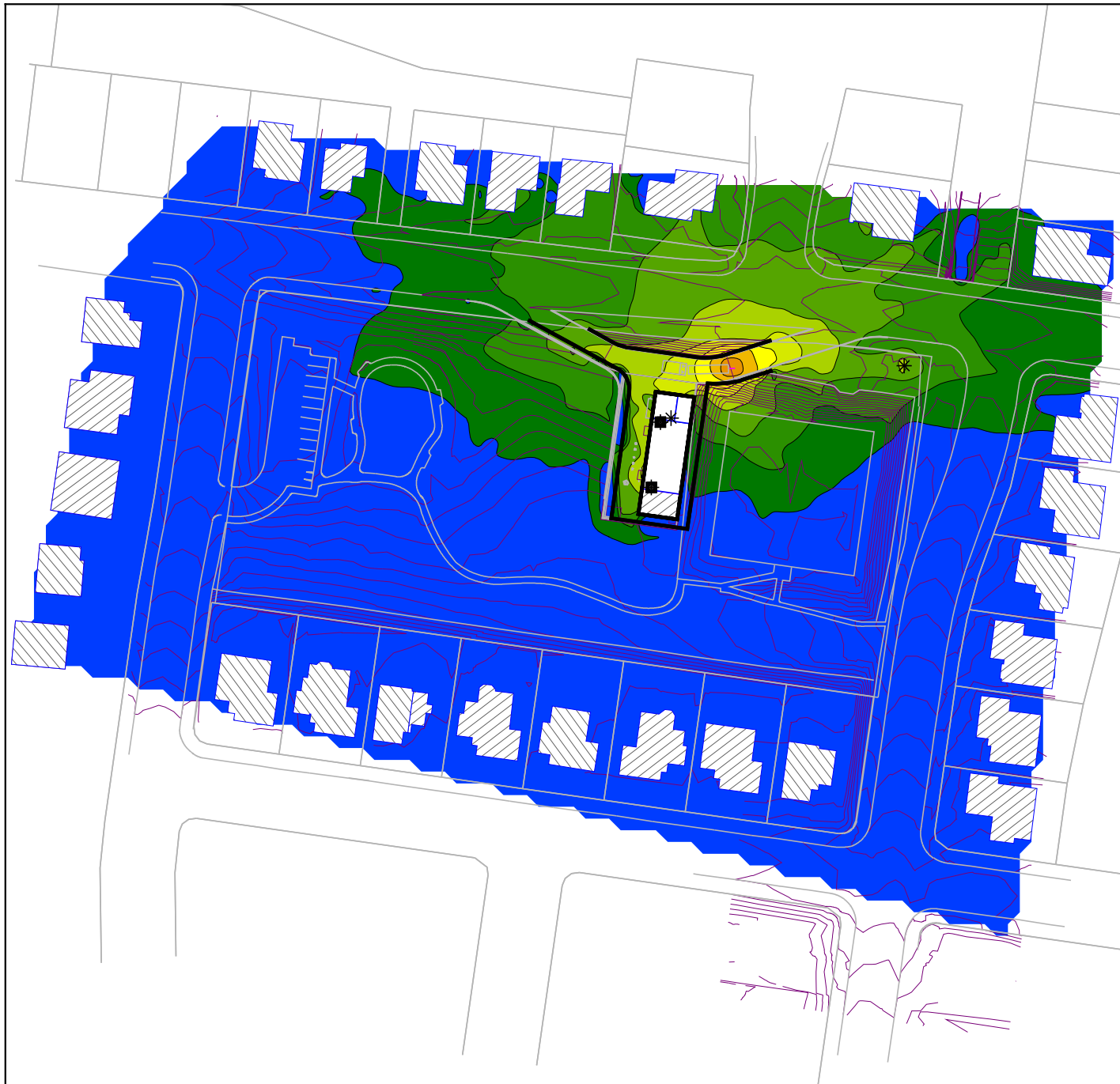


Calculation Date: April 13, 2015

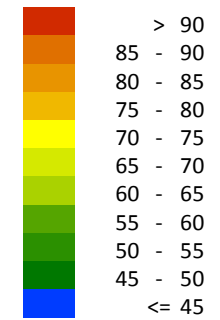


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**Figure III-4.
Estimated Noise Level
at Height of 5' Above
Ground Due to Chemical
Delivery, Mitigated**

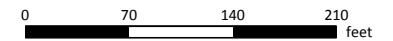


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

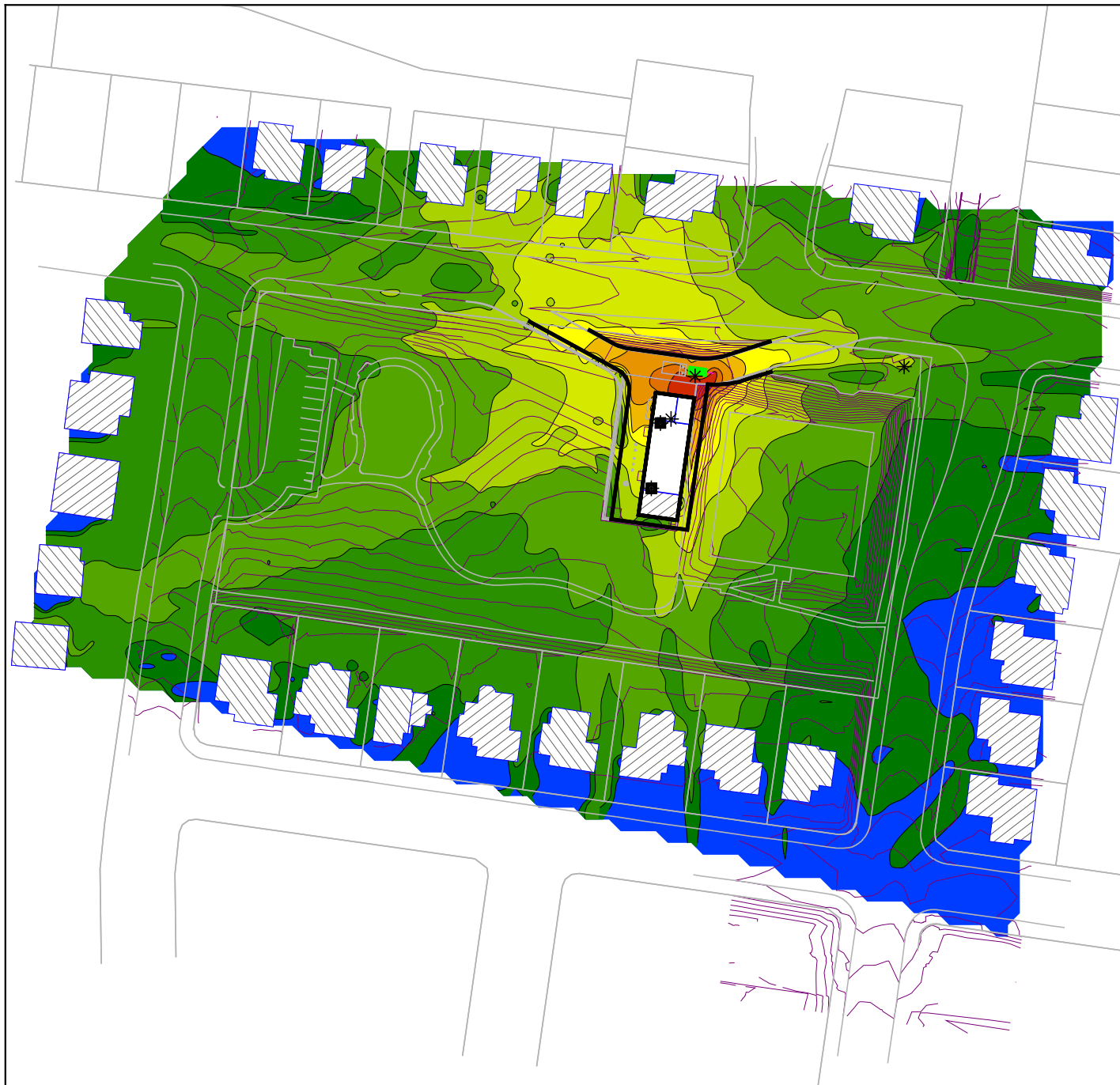


Calculation Date: April 13, 2015

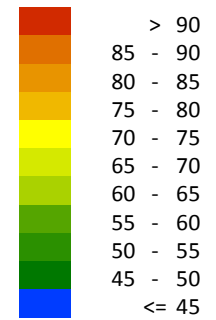


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**Figure III-5.
Estimated Noise Level
at Height of 5' Above
Ground Due to Fuel
Delivery, Mitigated**

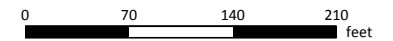


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

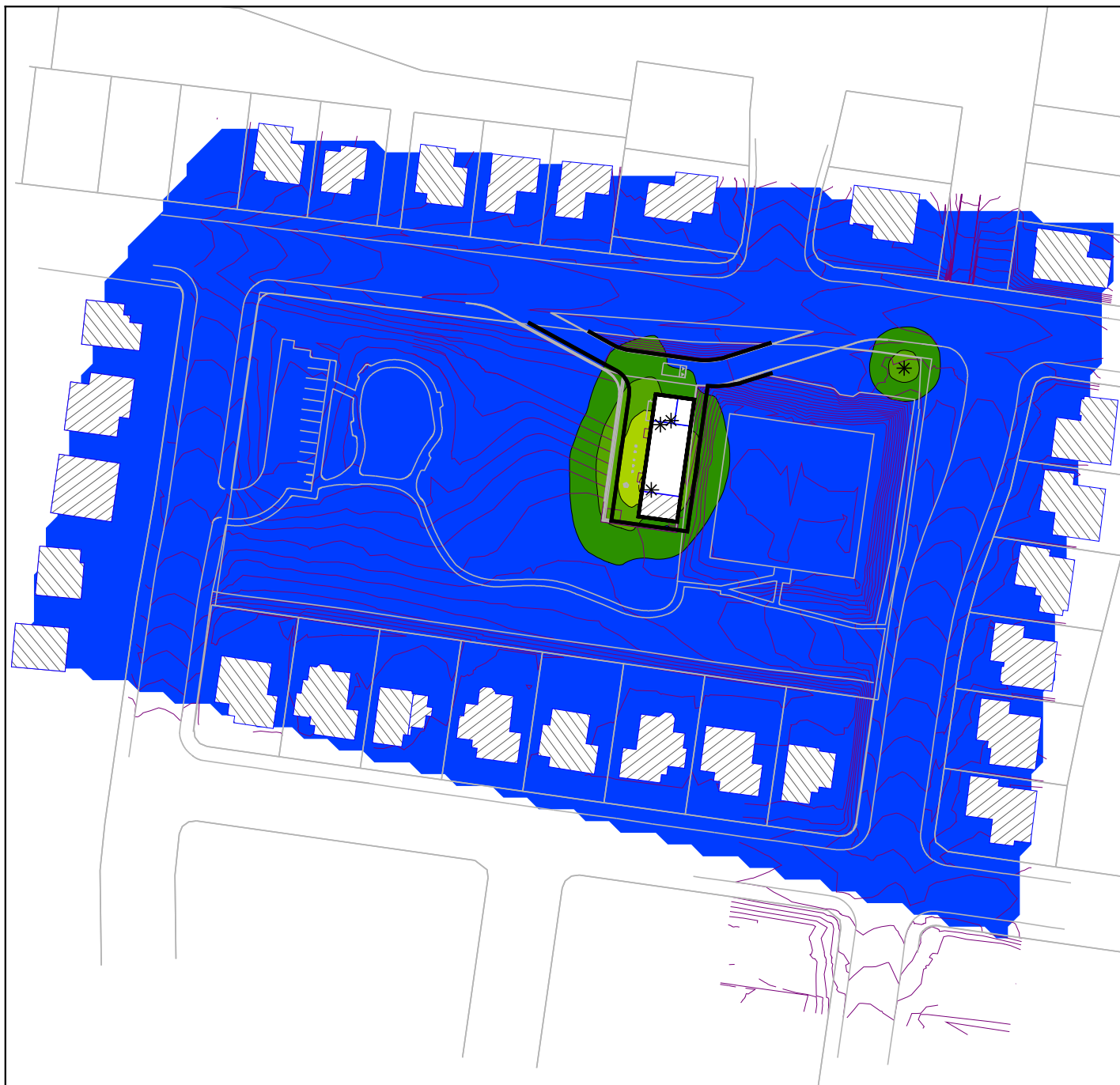


Calculation Date: January 14, 2016

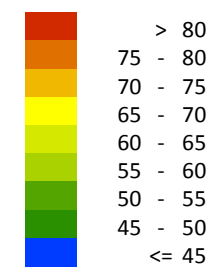


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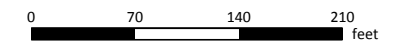
**Figure III-6.
Estimated Noise Level
at Height of 15' Above
Ground Due to Typical
Operations, Mitigated**



Noise Level, dBA

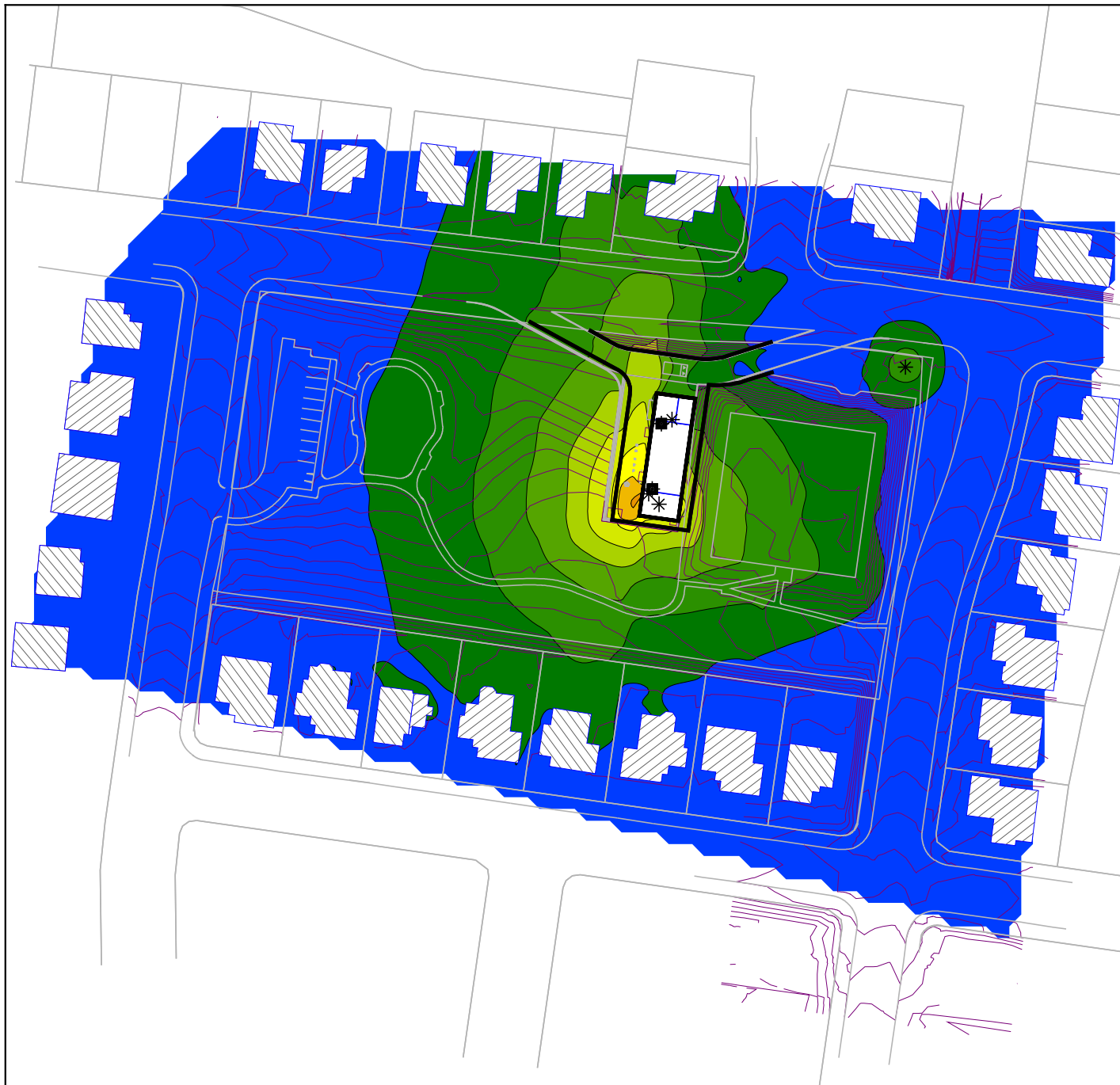


- Signs and symbols
- Elevation line
 - Homes/Buildings
 - Master Site Plan
 - Industrial building
 - Point source
 - Wall

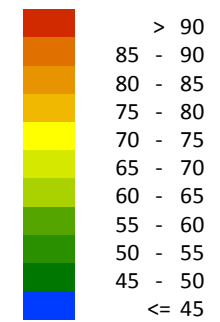


Calculation Date: February 24, 2015

Figure III-7.
Estimated Noise Level
at Height of 15' Above
Ground Due to Emergency
Generator Test, Mitigated

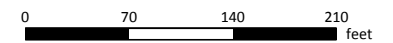


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

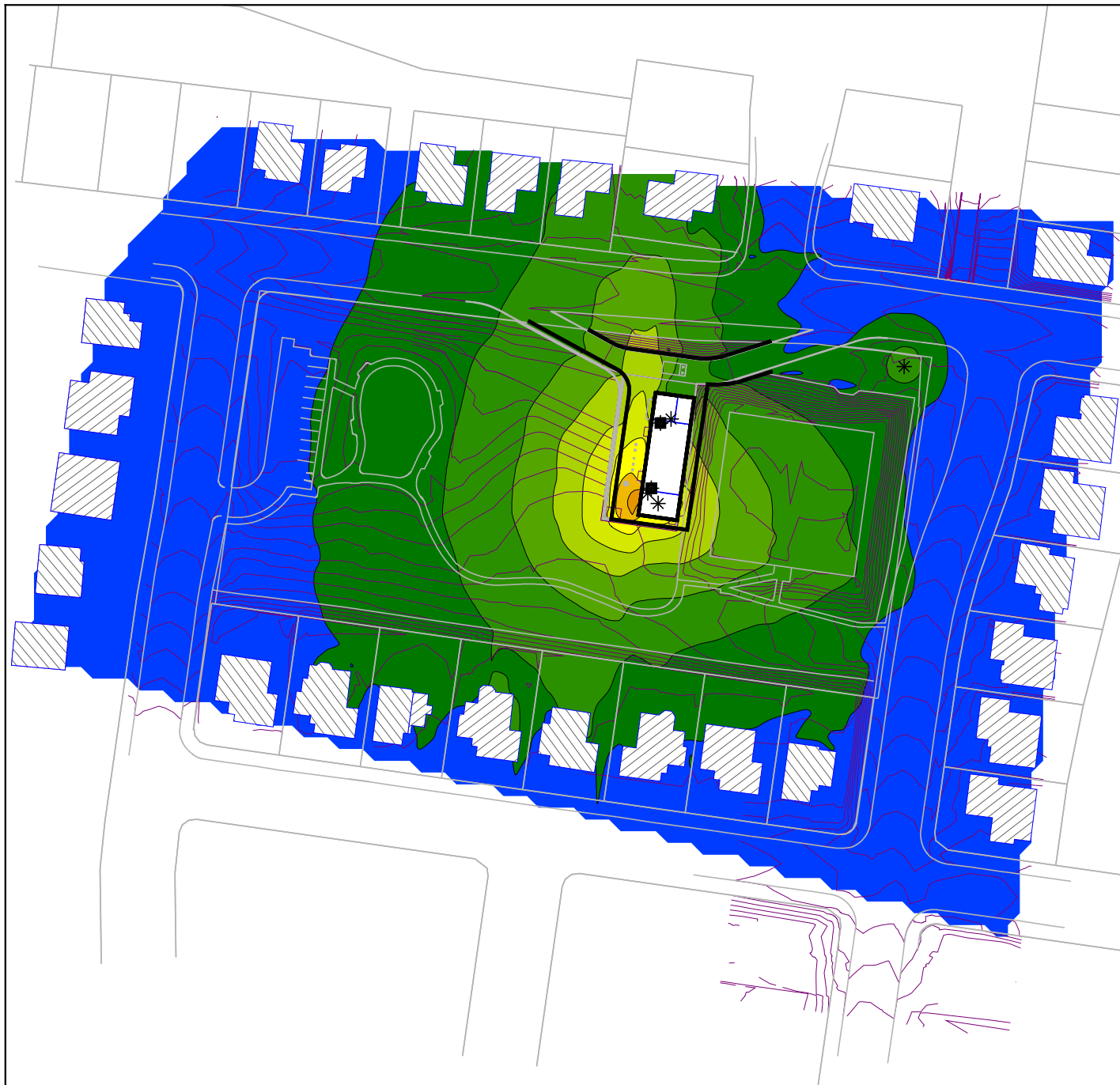


Calculation Date: January 14, 2016

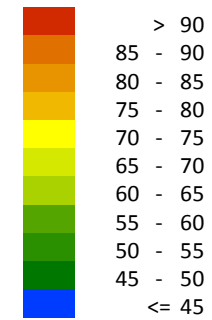


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**Figure III-8.
Estimated Noise Level
at Height of 15' Above
Ground Due to Emergency
Generator Operation,
Mitigated**

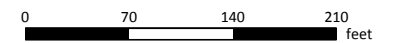


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

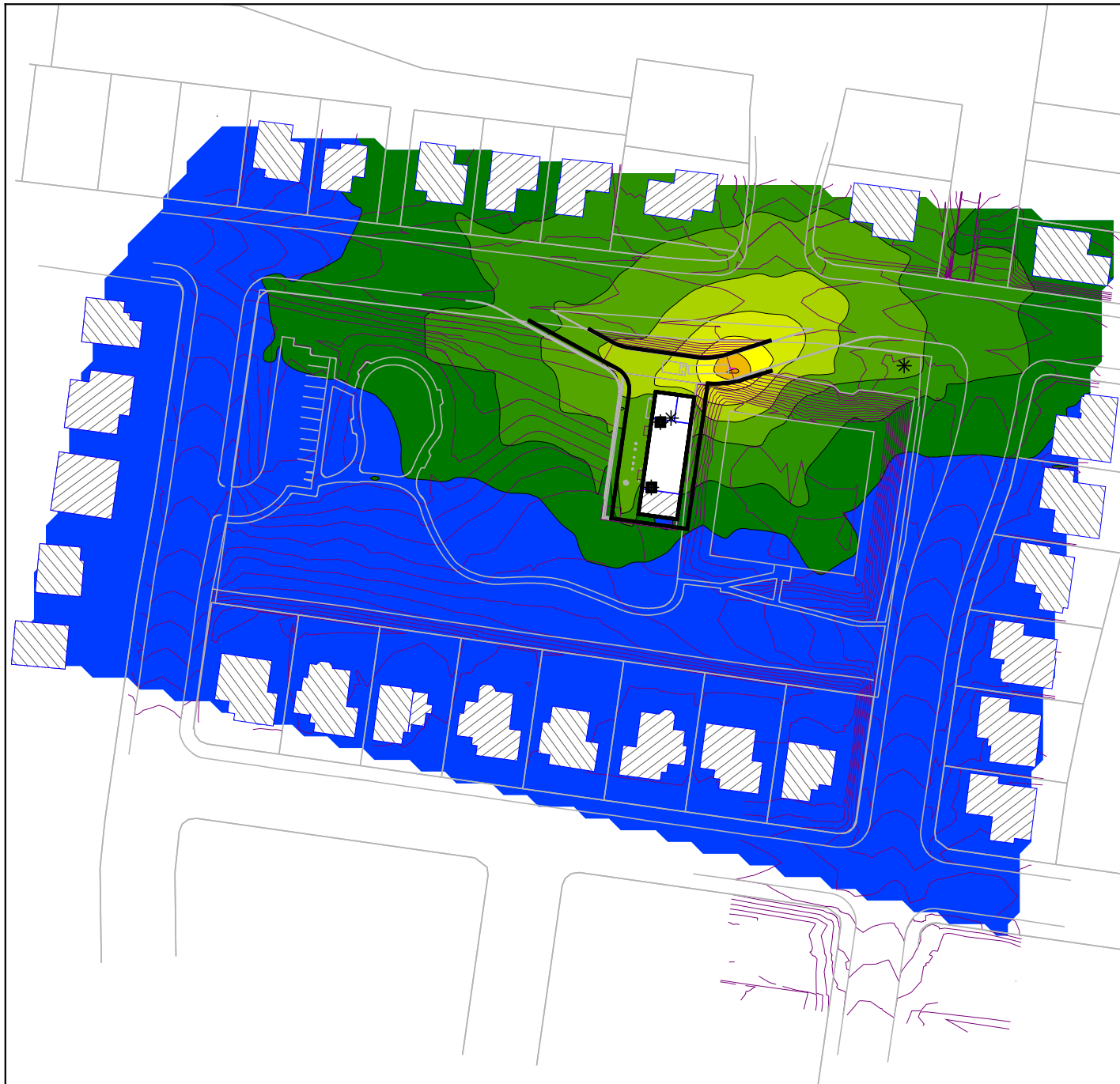


Calculation Date: January 14, 2016

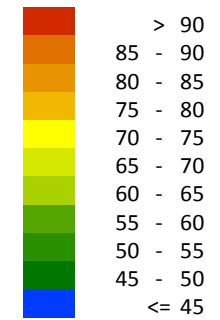


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**Figure III-9.
Estimated Noise Level
at Height of 15' Above
Ground Due to Chemical
Delivery, Mitigated**

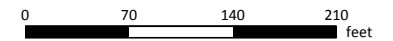


Noise Level, dBA



Signs and symbols

- Elevation line
- Homes/Buildings
- Master Site Plan
- Industrial building
- Point source
- Wall

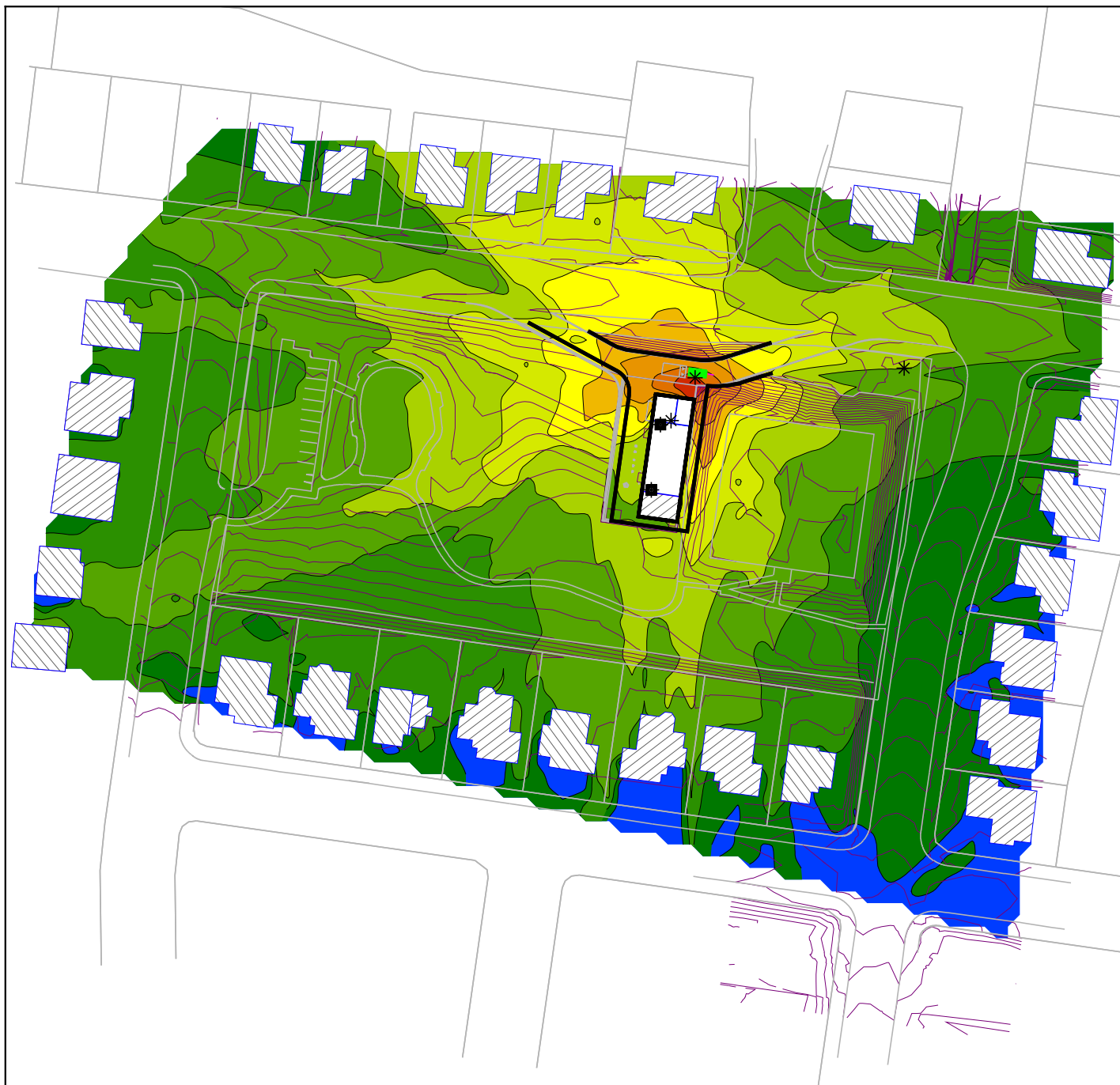


Calculation Date: January 14, 2016

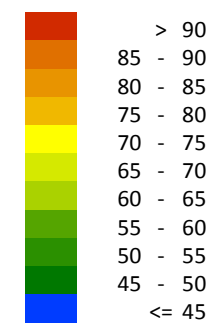


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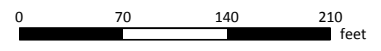
**Figure III-10.
Estimated Noise Level
at Height of 15' Above
Ground Due to Fuel
Delivery, Mitigated**



Noise Level, dBA



- Signs and symbols
- Elevation line
 - Homes/Buildings
 - Master Site Plan
 - Industrial building
 - Point source
 - Wall



Calculation Date: January 14, 2016