Limonite Gap Closure Project

Noise and Vibration Study

prepared for

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1.1 Introduction

This study analyzes the potential noise and vibration impacts of the proposed Limonite Avenue Gap Closure Project (project) in Eastvale, Riverside County, California. The purpose of this study is to analyze the project's noise and vibration impacts related to both temporary construction activity and long-term operation of the project. Table 1 provides a summary of project impacts.

Table 1 Summary of Impacts

Impact Statement	Level of Significance	Applicable Recommendations
Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less Than Significant Impact (Construction) Less Than Significant Impact (Operation)	None
Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?	Less Than Significant Impact	None
For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No Impact	None

1.2 Project Summary

Project Location

The project site is located in northwestern Eastvale, Riverside County, California. The project would construct a new segment of the Limonite Avenue corridor connecting existing Kimball Avenue west of the Hellman Avenue intersection to the existing Limonite Avenue east of Archibald Avenue, adjacent to the Cucamonga Creek Channel (CCC). Additionally, the project limits extend along the CCC from the existing Schleisman Road bridge to the existing Remington Avenue bridge.

Error! Reference source not found. shows the location of the site in the region, **Error! Reference source not found.** shows the project site in its local context, and **Error! Reference source not found.** shows the project site plan.

Project Description

Limonite Avenue is an east-west Urban Arterial that currently ends at Archibald Avenue. In order to improve the service and vehicular capacity of Limonite Avenue and connections between the neighboring City of Chino to the west and Interstate 15 (I-15) to the east, the project would construct an approximately 6,180 feet (1.17 mile) long new segment of Limonite Avenue between Kimball Avenue and the existing Limonite Avenue east of Archibald Avenue across the Cucamonga Creek Channel (CCC).

Improvements on Limonite Avenue are divided into three segments, described from west to east:

1. ***Limonite Avenue from Hellman Avenue to the CCC:*** Approximately 2,450 feet of the existing segment of Limonite Avenue west of the CCC would be improved. From 900 feet east of the intersection with Taylor Way to the existing terminus of Limonite Avenue, improvements include the addition of a Class II bike lane with a transition to a multi-use trail on both sides, including signage and pavement delineation. New road would be constructed from the existing terminus to the CCC, including curb/gutter, raised median, sidewalk improvements, landscaped parkway, and a multi-use trail on both sides, including signage and pavement delineation.
2. ***Cucamonga Creek Channel (CCC) Bridge:*** This entirely new bridge across the CCC would span approximately 330 feet long by 82 to 88 feet wide, constructed across the CCC to allow continuation of Limonite Avenue. The CCC Bridge would be a 3-span precast concrete girder bridge supported by pier walls at the intermediate supports and located within the CCC. The CCC Bridge would include two lanes in each direction and a Class I Bike Lane/Multi-Use Trail with raised median buffer.
3. ***Limonite Avenue east of the CCC Bridge to Archibald Avenue:*** This segment would be constructed in conjunction with the proposed Homestead industrial development, including a multi-lane roundabout, curb and gutter, two thru lanes in each direction, a raised median, multi-use trails and/or Class II bike lanes on both sides. Improvement widths throughout this section would vary between 108 and 124 feet. Roadway improvements at the intersection would include the construction of new curb ramps, installation and/or modification of the traffic signal, signing, pavement delineation, and street lights. A roundabout or alternative intersection control along Limonite Avenue is being considered for a primary access to the proposed Homestead development (approximately 1,500 feet east of the CCC) (Eastvale 2020). Limonite Avenue would be widened just west of the intersection to conform to lane configuration. The west leg of Limonite Avenue would introduce single left and right turn lanes for east-bound traffic. Roadway improvements at the intersection would include the construction of new curb ramps, installation and/or modification of the traffic signal, signing, pavement delineation, street lights, and relocation of conflicting overhead electrical, telecommunications, and cable television utilities. Improvement widths at the intersection would vary between 102 and 310 feet.

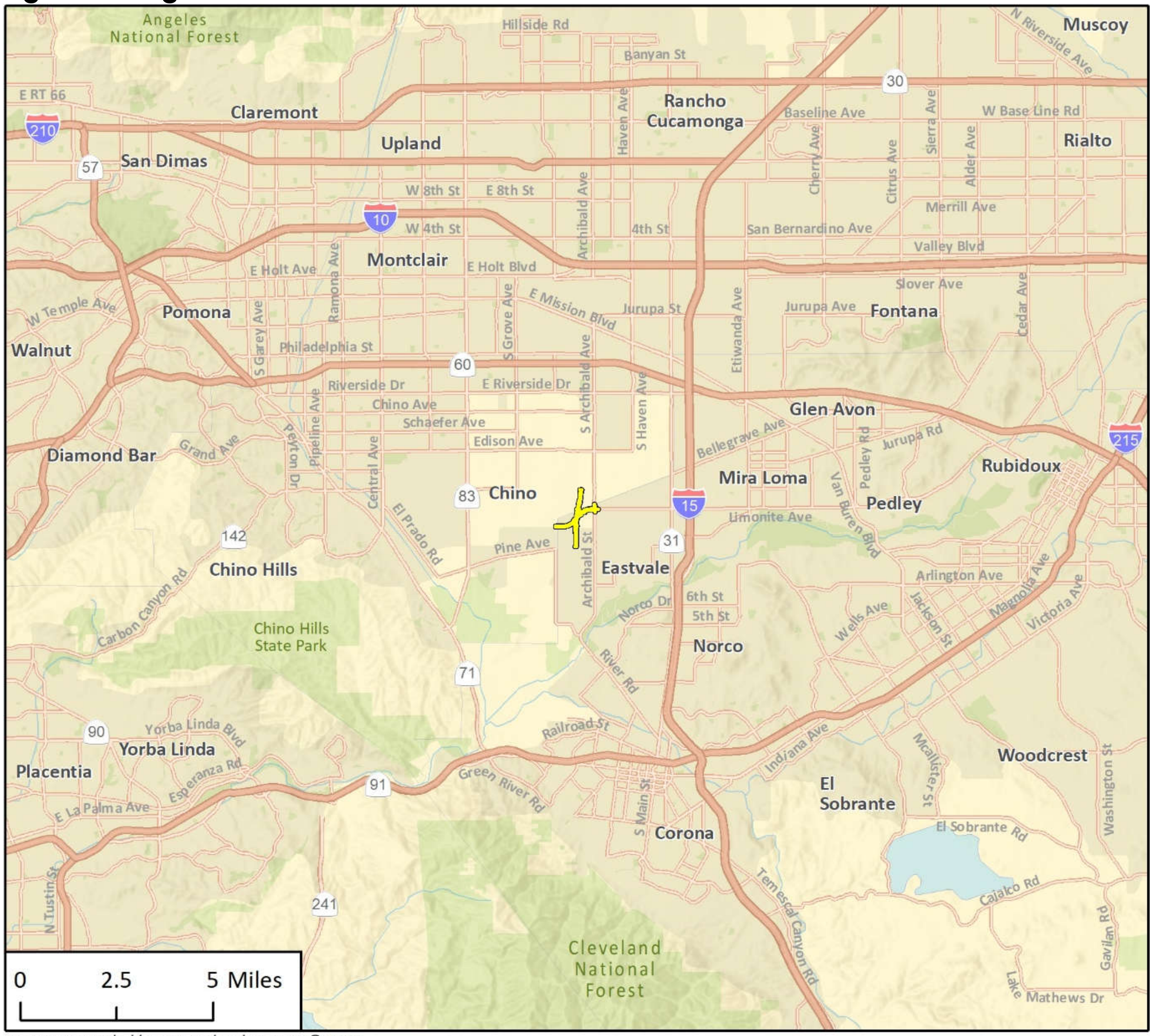
Construction within this area would also include the also involve the demolition/removals of multiple steel overhang feeding structures and a single-family residential building that is in conflict with the proposed roadway alignment located within the existing dairy property just west of Archibald Avenue. All removals will include the abatement of hazardous materials such as lead and asbestos containing materials per State and Federal rules and regulations. Additionally, multiple utility facilities may require relocation including, but not limited to, a high-pressure gas facility located within the dairy and overhead electrical distribution/transmission facilities located act the proposed Limonite Avenue / Archibald Avenue intersection. The City will coordinate directly with the owners of the utility facilities in conflict for them to relocate their facilities prior to construction of the proposed roadway improvements.

Additional improvements include:

- A new 180-foot long bicycle/pedestrian bridge across the CCC approximately 1,000 feet south of the proposed CCC Bridge that would close the gap of an existing multi-use trail located within the Southern California Edison (SCE) easement/ transmission line area north of the Symphony at the Trails residential development. The proposed steel prefabricated bridge would vary between 12 to 16 feet wide to accommodate two-way multi-use travel.
- New catch basins and inlet structures constructed as necessary within the roadway limits with storm drain laterals to convey upstream and project-generated drainage.
- Domestic/reclaimed water and sewer mainline facilities will be installed connecting existing Jurupa Community Services District facilities located along the existing section of Limonite Avenue west of the CCC to facilities located at the Archibald Avenue/Limonite Avenue intersection.
- Landscape planting and hardscapes improvements would be installed in parkway areas adjacent to existing and proposed meandering sidewalk/Class II bike facilities/multi-use trails and in the raised medians.
- Street lighting would be installed along the corridor on both sides of Limonite Avenue.

Project construction would occur over approximately 12 months, with construction anticipated to begin in January 2022 and be completed in January 2023. Construction would involve grading and excavation for roadway improvements, bridge construction, paving activities, and architectural coating and pavement striping. It is anticipated that export/hauling operations may exceed 50,000 cubic yards of excess soils. Additionally, it is anticipated the project will require import materials that may exceed over 50,000 cubic yards depending on final grading elevations.

Figure 1 Regional Location



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Project Location

N

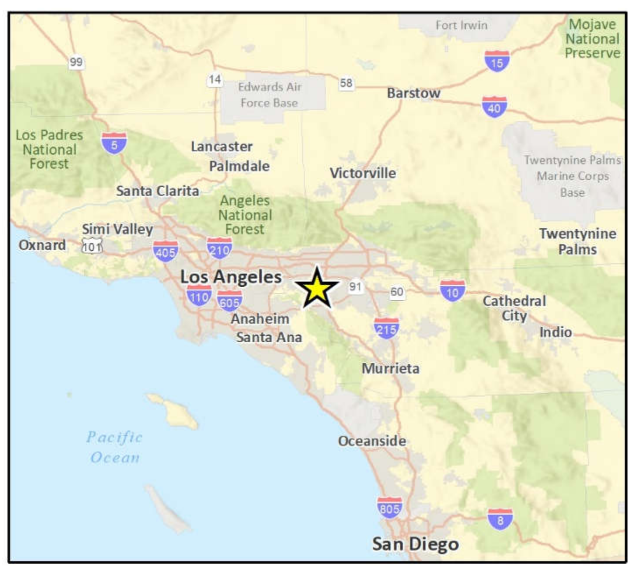

Figure 2 Project Site Location

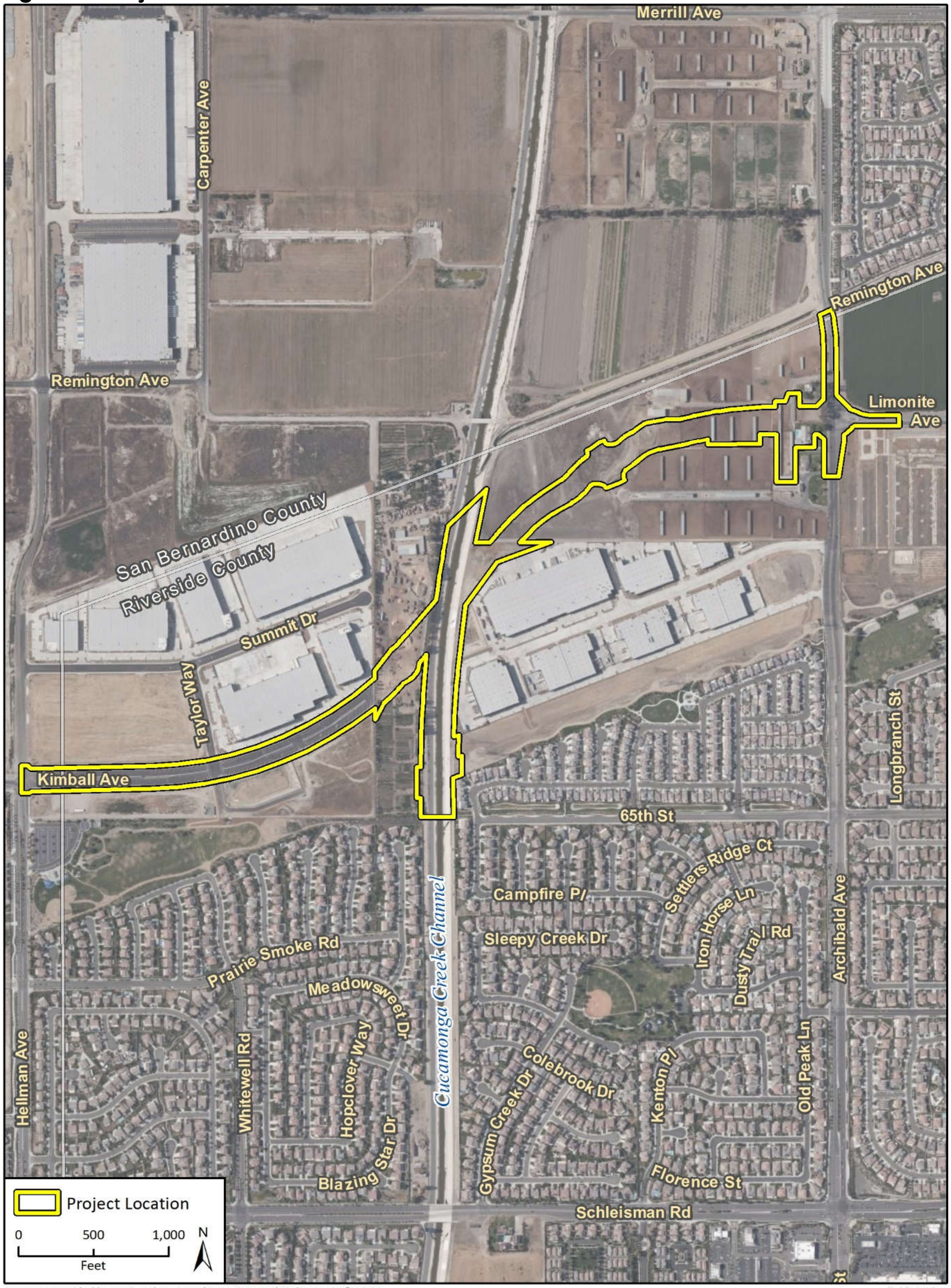

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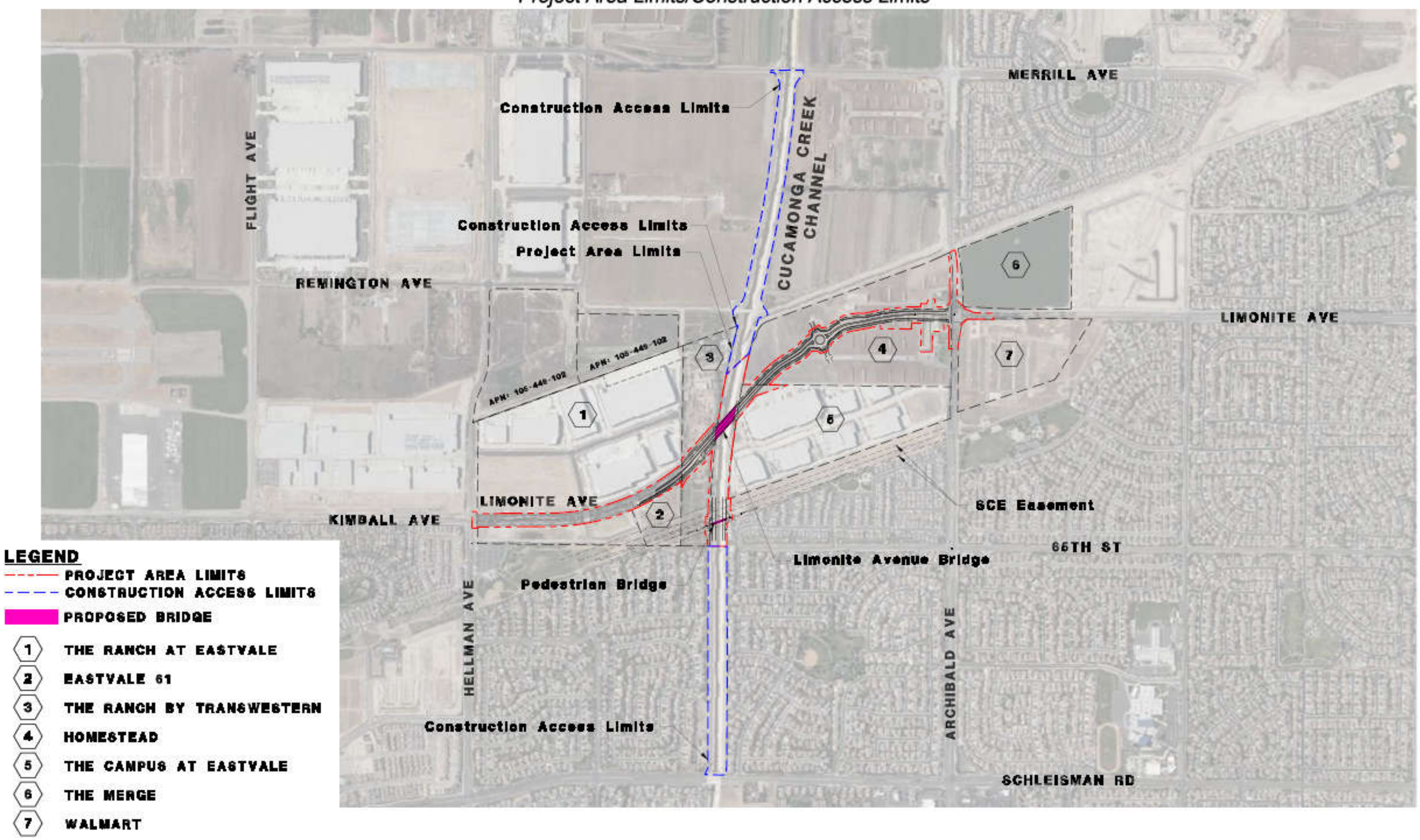
Figure 3 Site Plan

Limonite Avenue Gap Closure Project

Project Area Limits/Construction Access Limits



2 Background

2.1 Overview of Sound Measurement

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (Caltrans 2013a).

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz and less sensitive to frequencies around and below 100 Hertz (Kinsler, et. al. 1999). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dBA; reducing the energy in half would result in a 3 dBA decrease (Crocker 2007).

Human perception of noise has no simple correlation with sound energy: the perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease (i.e., twice the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (half) as loud ([10.5x the sound energy] Crocker 2007).

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in level as the distance from the source increases. The manner in which noise reduces with distance depends on factors such as the type of sources (e.g., point or line, the path the sound will travel, site conditions, and obstructions). Noise levels from a point source typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance (e.g., construction, industrial machinery, ventilation units). Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013a). The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site, such as a parking lot or smooth body of water, receives no additional ground attenuation and the changes in noise levels with distance (drop-off rate) result from simply the geometric spreading of the source. An additional ground attenuation value of 1.5 dBA per doubling of distance applies to a soft site (e.g., soft dirt, grass, or scattered bushes and trees) (Caltrans 2013a). Noise levels may also be reduced by intervening structures. The amount of attenuation provided by this “shielding” depends on the size of the object and the frequencies of the noise levels. Natural terrain features such as hills and dense woods, and man-made features such as buildings and walls, can substantially alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5-dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2017). Structures can substantially reduce exposure to noise as well. The FHWA’s guidelines indicate that modern building construction generally provides an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows.

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important factors of project noise impact. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. One of the most frequently used noise metrics is the equivalent noise level (L_{eq}); it considers both duration and sound power level. L_{eq} is defined as the single steady A-weighted level equivalent to the same amount of energy as that contained in the actual fluctuating levels over time. Typically, L_{eq} is summed over a one-hour period. L_{max} is the highest root mean squared (RMS) sound pressure level within the sampling period, and L_{min} is the lowest RMS sound pressure level within the measuring period (Crocker 2007). Noise that occurs at night tends to be more disturbing than that occurring during the day. Community noise is usually measured using Day-Night Average Level (L_{dn}), which is the 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours.

2.2 Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of Hz. The frequency of a vibrating object describes how rapidly it oscillates. The normal frequency range of most groundborne vibration that can be felt by the human body starts from a low frequency of less than 1 Hz and goes to a high of about 200 Hz (Crocker 2007).

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings, such as from nearby construction activities, may cause windows, items on shelves, and pictures on walls to rattle. Vibration of building components can also take the form of an audible low-frequency rumbling noise, referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the vibration source (Federal Transit Administration [FTA] 2018). Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and annoying to building occupants and vibration-sensitive land uses.

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations diminish much more rapidly than low frequencies, so low frequencies tend to dominate the spectrum at large distances from the source. Discontinuities in the soil strata can also cause diffractions or channeling effects that affect the propagation of vibration over long distances (Caltrans 2013b). When a building is affected by vibration, a ground-to-foundation coupling loss will usually reduce the overall vibration level. However, under rare circumstances, the ground-to-foundation coupling may actually amplify the vibration level due to structural resonances of the floors and walls.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (Caltrans 2013b).

2.3 Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. Sensitive land uses are generally defined as locations where people reside or where the presence of noise could adversely affect the use of the land. The City General Plan list of noise sensitive uses includes residential dwellings, hotels, hospitals, nursing homes, educational facilities, libraries, and biological open space (City of Indio 2019). Surrounding land uses that would be considered sensitive receivers include the Shadow Hills RV Resort located approximately 330 feet to the north (zoned Community Commercial [CC]), vacant parcels located approximately 200 feet across Jefferson Street (northern parcel is zoned Residential Light [RL]; southern parcel is zoned Mixed-Use Specific Plan [MU SP]), and area designated as Sun City Shadow Hills Project Master Plan (PMP) east of the project site that is a single-family neighborhood.

Vibration sensitive receivers are similar to noise sensitive receivers, such as residences and institutional uses (e.g., schools, libraries, and religious facilities). However, vibration sensitive receivers also include buildings where vibrations may interfere with vibration-sensitive equipment, affected by levels that may be well below those associated with human annoyance (FTA 2018; Caltrans 2013b).

2.4 Project Noise Setting

The most common source of noise in the project site vicinity is vehicular traffic from Archibald Avenue, Kimball Avenue, and Hellman Avenue. To characterize ambient sound levels at and near the project site existing traffic volumes from the project traffic report were modeled and are presented in Table 2.

Table 2 Existing Traffic Noise Levels

Receiver	Land Use	CNEL
1	SFR	66
2	SFR	64
3	Comm.	49
4	Comm.	66
5	Comm.	68
6	SFR	52
7	SFR	54
8	SFR	53
9	Park	57
10	Park	58
11	Comm.	71
12	SFR	62
13	SFR	61
14	SFR	62
15	Comm.	65

Receiver locations are shown in Figure 4.

2.5 Regulatory Framework

City of Eastvale General Plan Noise Element

The City of Eastvale has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of City of Eastvale from excessive exposure to noise. The Noise Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation and stationary noise sources. To protect the City of Eastvale residents from excessive noise, the Noise Element contains the following four goals:

- **N-1** Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors and noise-sensitive uses of Eastvale.
- **N-2** Locate noise-tolerant land uses within areas irrevocably committed to land uses that are noise-producing, such as transportation corridors.
- **N-3** Ensure that noise sensitive uses do not encroach into areas needed by noise generating uses.
- **N-4** Locate noise sources away from existing noise sensitive land uses unless appropriate noise control measures are provided.

Table 3 *Noise Compatibility by Land Use Designation* in the City of Eastvale General Plan provides guidelines to evaluate the acceptability of the transportation related noise level impacts (Eastvale 2012). Residential land use in the Project study area, is considered *completely compatible* with exterior noise levels below 60 CNEL and *tentatively compatible* with noise levels between 60 to 70 CNEL. Non-residential, or non-noise-sensitive use, is considered *completely compatible* with exterior noise levels less than 70 CNEL, and *tentatively compatible* with exterior noise levels approaching 75 CNEL.

Table 3 Noise Compatibility by Land Use Designation

Land Use Designations	Completely Compatible	Tentatively Compatible	Normally Incompatible	Completely Incompatible
All Residential (Single- and Multi-Family)	Less than 60 dBA	60-70 dBA	70-75 dBA	Greater than 75 dBA
All Non-Residential (Commercial, Industrial & Institutional)	Less than 70 dBA	70-75 dBA	Greater than 75 dBA	(2)
Public Parks (Lands on which public parks are located or planned)	Less than 65 dBA	65-70 dBA	70-75 dBA	Greater than 75 dBA

(1) All noise levels shown in this table are designated CNEL.
(2) To be determined as part of the project review process.

Stationary-Source Noise Level Standards

The City of Eastvale General Plan Noise Element identifies exterior noise limits to control operational noise impacts associated with the onsite noise sources, such as heating, ventilation and air conditioning units. Table 4 provides the City's standards for maximum exterior non-transportation noise levels to which land designated for residential land uses may be exposed for any 30-minute period on any day.

Table 4 Exterior Noise Level Standards for Non-Transportation Noise

Land Use Type	Time Period Maximum	Noise Level (dBA)
Single-Family Homes and Duplexes	10 p.m. to 7 a.m.	50
	7 a.m. to 10 p.m.	60
Multiple Residential 3 or More Units Per Building (Triplex +)	10 p.m. to 7 a.m.	55
	7 a.m. to 10 p.m.	60

Construction Noise Level Standards

The City of Eastvale has set restrictions to control noise impacts associated with the construction of the proposed project. According to the City of Eastvale Municipal Code Section 8.52.020, construction activities are limited to the hours of 6:00 a.m. to 6:00 p.m. June through September, and 7:00 a.m. to 6:00 p.m. October through May. However, the City has not established a numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a substantial temporary or periodic noise increase.

While the City does not have specific noise level criteria for assessing construction noise impacts, the FTA has developed guidance for determining whether construction of a project would result in a substantial temporary increase in noise levels (FTA 2018). Based on FTA guidance, a significant impact would occur if project-generated construction noise exceeds a 1-hour 80 dBA L_{eq} noise limit at a residence (FTA 2018). Similarly, the FTA recommends that in urban environments construction should not double the ambient noise level.

Vibration Standards

Policy N-3 of the the City of Eastvale General Plan Noise Element identifies a vibration level standard for sensitive land uses of 0.0787 inches per second (in./sec.) peak particle velocity (PPV). Therefore, for the purposes of this analysis, the vibration level shall not exceed 0.0787 in./sec. PPV at the nearby sensitive receiver locations during project construction activities.

3 Methodology

3.1 Construction Noise

Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (FHWA 2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, construction noise levels were estimated at noise sensitive receivers near the project site. RCNM provides reference noise levels for standard construction equipment, with an attenuation rate of 6 dBA per doubling of distance for stationary equipment.

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FHWA 2018). Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some have high-impact noise levels.

Construction activity would result in temporary noise in the project site vicinity, exposing surrounding nearby receivers to increased noise levels. Construction noise would typically be higher during the heavier periods of initial construction (i.e., site preparation and grading) and would be lower during the later construction phases (i.e., building construction and paving). Typical heavy construction equipment during project grading could include dozers, loaders, graders, excavators, lifts, water trucks and dump trucks. It is assumed that diesel engines would power all construction equipment. Construction equipment would not all operate at the same time or location. In addition, construction equipment would not be in constant use during the 8-hour operating day.

Project construction would occur nearest to the residential land uses located at the southwest corner of the Hellman Avenue and Limonite Avenue/Kimball Avenue intersection. Over the course of a typical construction day, construction equipment would be located as close as 80 feet to residential properties but would typically be located at distance farther away due to the nature of construction and the length of the project alignment. For example, during a typical construction day, the equipment would operate along the entire length of the alignment up to 6,000 feet away from the nearest residential receiver. The longest single location construction would occur at the proposed bridge site; however, the bridge location is approximately 1,000 feet from the nearest noise sensitive receiver. Therefore, it is assumed that over the course of a typical construction day the construction equipment would operate at an average distance of at least 300 feet from the nearest residential receivers.

Construction noise is typically loudest during activities that involve excavation and move soil, such as site preparation and grading. A typical construction scenario would include a dozer, a front-end loader, and an off-road truck working in concert to grade, excavate, load, and remove or replace soil within the alignment. A similar set of equipment would be used in the placement of road base and paving. At a distance of 300 feet, a dozer, front-end loader and a dump truck would generate a noise level of 65 dBA L_{eq}.

3.2 Groundborne Vibration

The project does not include any substantial vibration sources associated with operation. Thus, construction activities have the greatest potential to generate ground-borne vibration affecting nearby receivers, especially during grading and excavation of the project site. The greatest vibratory source during construction within the project vicinity would be an excavator. Large bulldozer was used for the purpose of this analysis as they create similar vibration levels during construction activities. Neither blasting nor pile driving would be required for construction of the project. Construction vibration estimates are based on vibration levels reported by Caltrans and the FTA (Caltrans 2013b, FTA 2018). Table 5 shows typical vibration levels for various pieces of construction equipment used in the assessment of construction vibration (FTA 2018).

Table 5 Vibration Levels Measured during Construction Activities

Equipment	PPV at 25 ft. (in/sec)
Vibratory Roller	0.210
Large Bulldozer	0.089
Loaded Trucks	0.076
Small Bulldozer	0.003

Source: FTA 2018

Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors; therefore, the vibration level threshold is assessed at occupied structures (FTA 2018). Therefore, all vibration impacts are assessed at the structure of an affected property.

3.3 Operational Noise Sources

The project is a roadway and would not have any on-site noise sources other than traffic utilizing the roadway.

Traffic Noise

Noise affecting surrounding properties would primarily result from traffic on Limonite Avenue. Traffic noise was modeled with the FHWA Traffic Noise Model (TNM), version 2.5. The traffic analysis' (Fehr and Peers 2019) provided turning movements at affected intersections for the existing, opening year, and design year (2042) conditions. To determine the average daily traffic (ADT) volume the highest peak hour traffic on each roadway segment was adjusted to an ADT volume based on the average reported peak hour factor for all roadway segments in the traffic study. Modeled traffic volumes are shown in Table 6.

Modeling was conducted for 15 local single-family residences and commercial land uses. Modeled noise receivers are shown in Figure 4. The posted speed limit on Limonite Avenue, Kimball Avenue, Hellman Avenue, and Archibald Avenue is 50 miles per hour (mph). To determine the vehicle classification mix for modeling, the vehicle classification mix (89.65% automobiles, 7.02% medium trucks, and 3.33% heavy trucks)) and day, evening, and nighttime split (68.7% daytime, 13% evening,

Figure 4 Receiver Locations

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and 18.3% nighttime) used for the nearby Homestead project was used to generate CNEL values from traffic (Urban Crossroads 2019).

Table 6 Traffic Volumes

Roadway	Existing ADT	Opening Year	Design Year (2042)
Limonite Avenue	12,500	14,500	27,150
Hellman Avenue	8,286	8,462	11,978
Archibald Avenue	29,440	23,516	39,121

Source: Fehr and Peers. 2019

3.4 Significance Thresholds

The following thresholds are based on Eastvale noise standards and Appendix G of the CEQA guidelines. Noise impacts would be considered significant if:

- **Item 1:** The project would result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
  - Based on policies N-4 and N-9, if the project resulted in noise levels in excess of tentatively acceptable levels, or interior noise levels at an affected resident exceeds interior noise level limits, impacts would be considered significant.
- **Item 2:** The project would result in the generation of excessive ground-borne vibration or ground-borne noise levels.
  - If the project results in vibration levels in excess of 0.0787 in./sec. PPV, it would be considered significant.
- **Item 3:** For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, if the project exposes people residing or working in the project area to excessive noise levels.

4 Impact Analysis

4.1 Item 1 – Temporary and Permanent Noise Increase

Item:	Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? *(Less Than Significant Impact)*

Construction

As described in Section 3.1, at a distance of 300 feet, a dozer, front-end loader and a dump truck would generate a noise level of 65 dBA L_{eq}. The FTA's construction noise limit is 80 dBA L_{eq} for residential land uses; therefore, project construction noise levels would not exceed construction noise thresholds. Therefore, impacts from construction noise would be less than significant.

Operation

The project would not have any on-site stationary noise sources. The primary impacts from project operation would be vehicles operating on the new roadway as it would represent a new permanent noise source in the project area.

The project would not generate new vehicle trips but would create a roadway and future traffic would generate noise along the new alignment. In addition, the gap closure would draw existing traffic from other roadways, changing the traffic pattern on those roadways. The increase in roadway noise with the addition of project traffic for is shown in

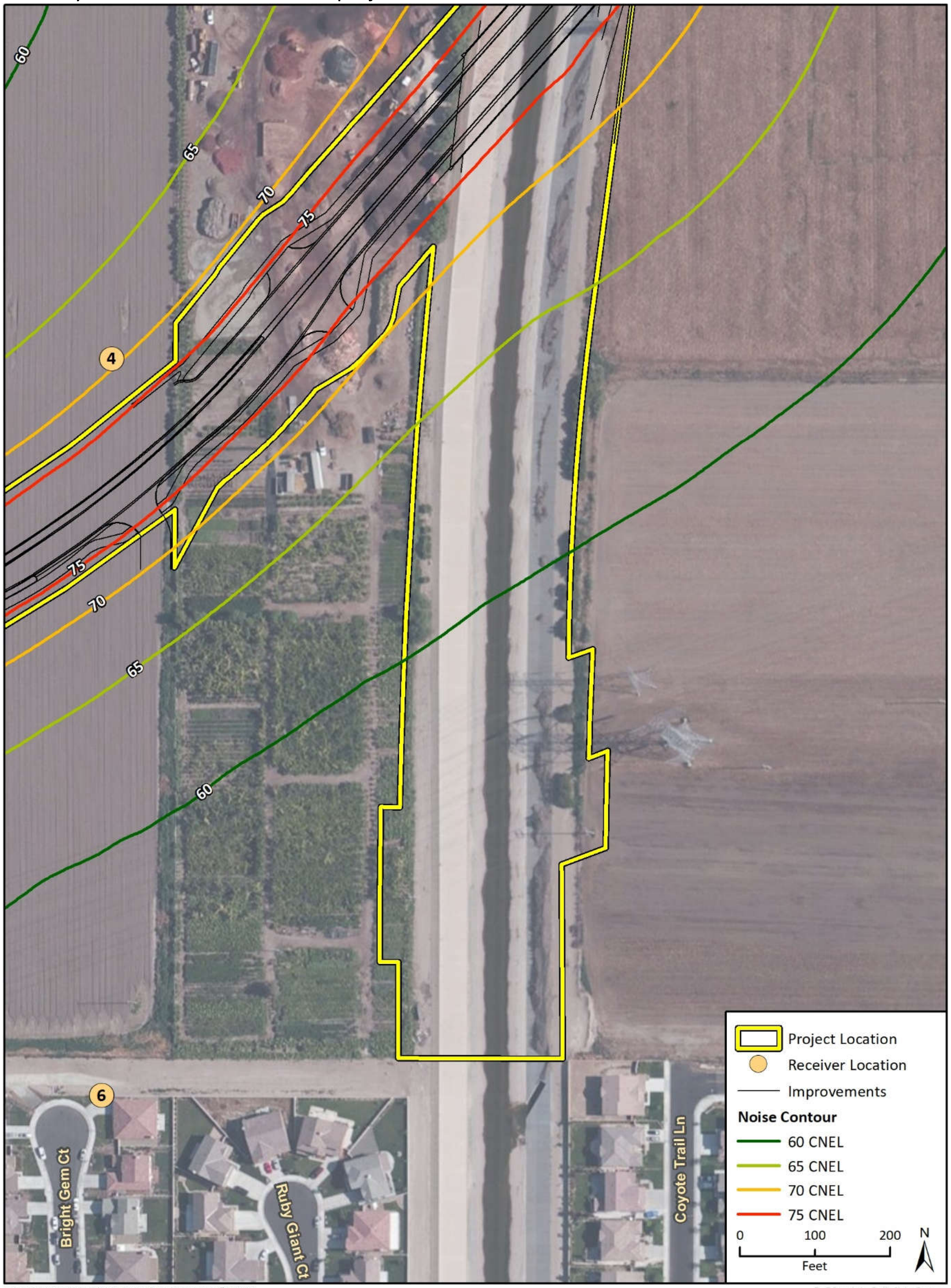

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Figure 15 Design Year (2024) Noise Level Contours

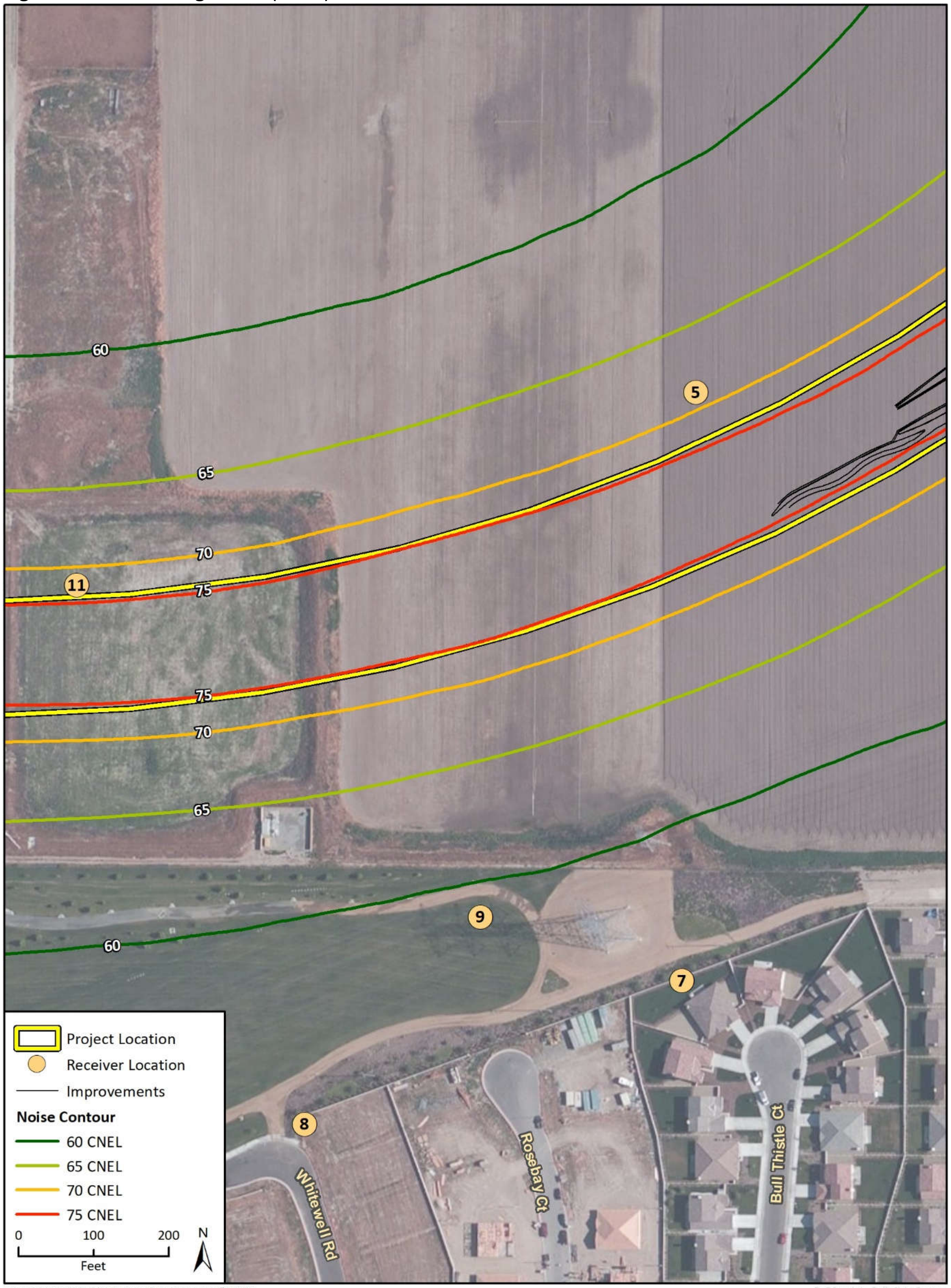

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Figure 16 Design Year (2024) Noise Level Contours

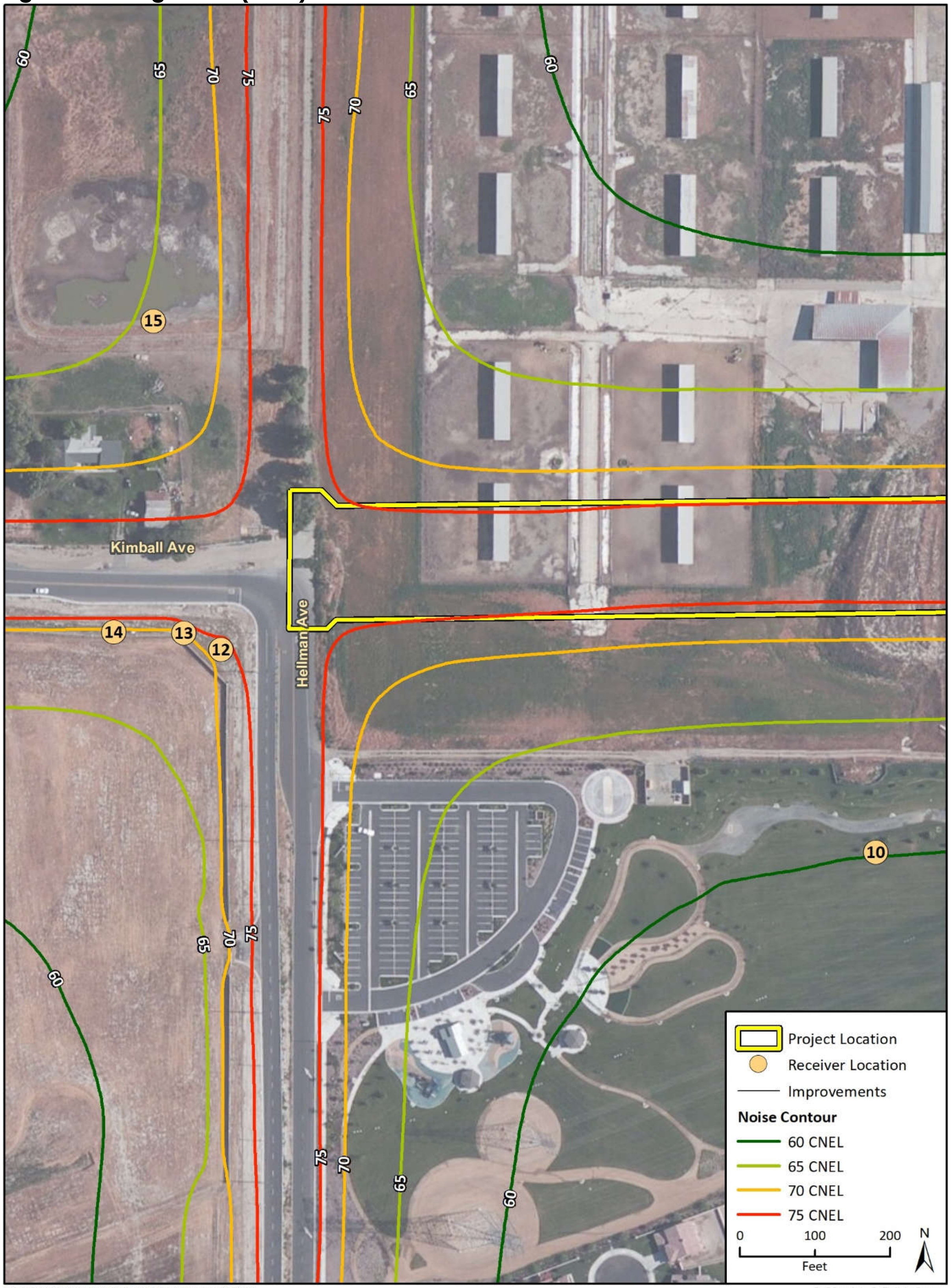

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Table 7. Traffic data was obtained from the project's Traffic Impact Analysis (Fehr and Peers 2019). Due to the type of project and the lack of an existing roadway along most of the alignment, the project is evaluated against the noise levels increase near existing roadways and against the City's Land Use Compatibility levels. Thus, if the project results in an increase of greater than 3 dBA but does not increase noise levels over the tentatively acceptable levels then the noise level increase would not be considered significant.

Modeled results are shown in Table 7and noise level contours along the project alignment are presented in Figure 5 though Figure 10 for the opening year and Figure 11 through Figure 16 for the design year. Based on the modeled noise levels in Table 7, in the opening year the project would generally result in a 1 dBA increase at local receivers, with the exception of Receiver 3, where the increase would be approximately 21 dBA. However, the future noise level would be 70 CNEL and would be completely compatible with the commercial land use per Eastvale General Plan Noise Element standards and the increases in noise levels in the opening year would be less than significant. Similarly, as shown in Table 7, in the design year the project would generally result in a 1 to 4 dBA increase at local receivers, with the exception of Receiver 3, where the increase would be approximately 24 dBA. The other receivers where increases greater than 3 dBA would occur are 6, 8 and 11. However, as with the opening year noise levels, these noise levels would be completely compatible with the affected land uses per Eastvale General Plan Noise Element standards and the increases in traffic noise levels would be less than significant.

Figure 5 Opening Year (2022) Noise Level Contours

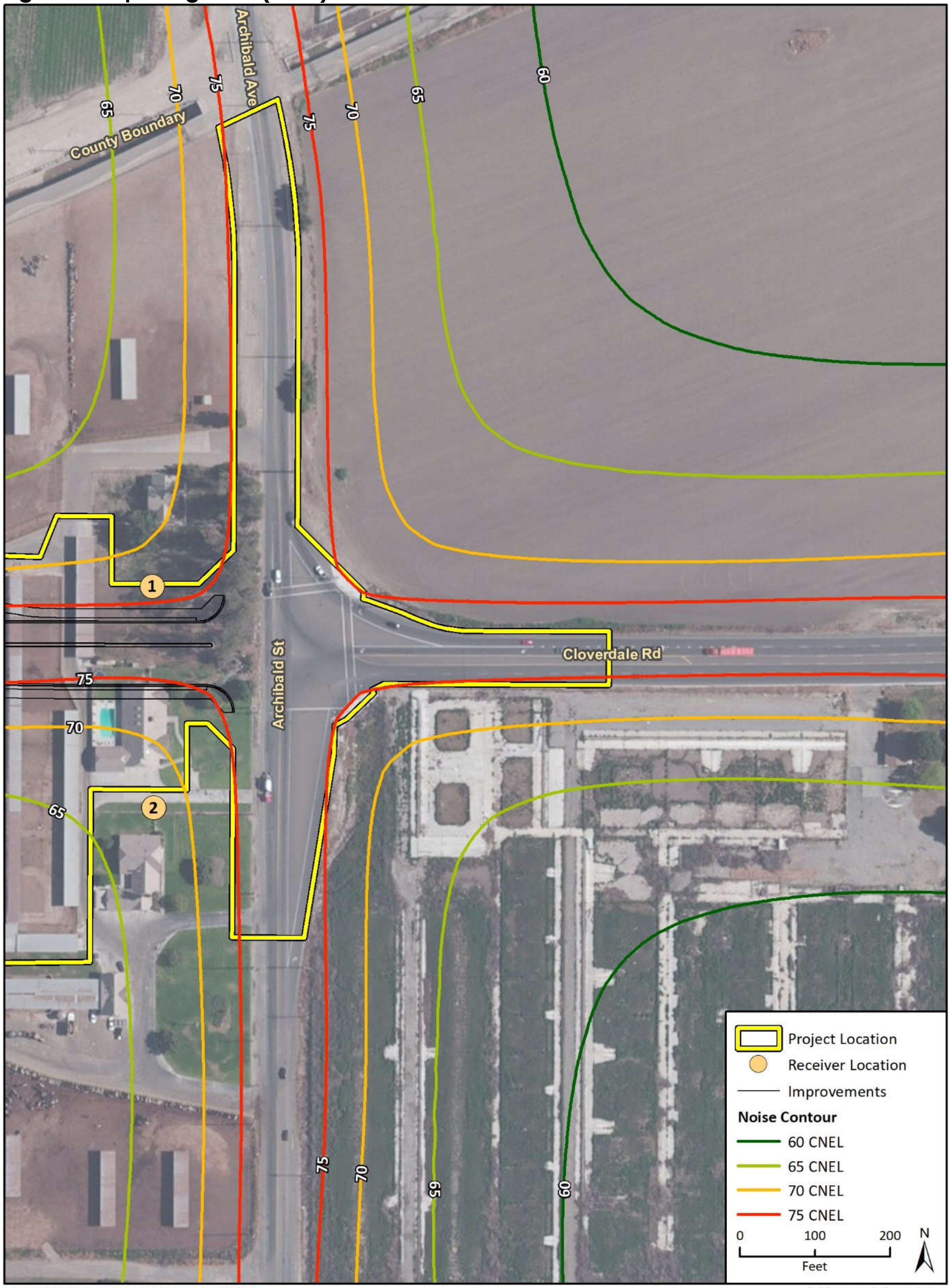

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Figure 6 Opening Year (2022) Noise Level Contours

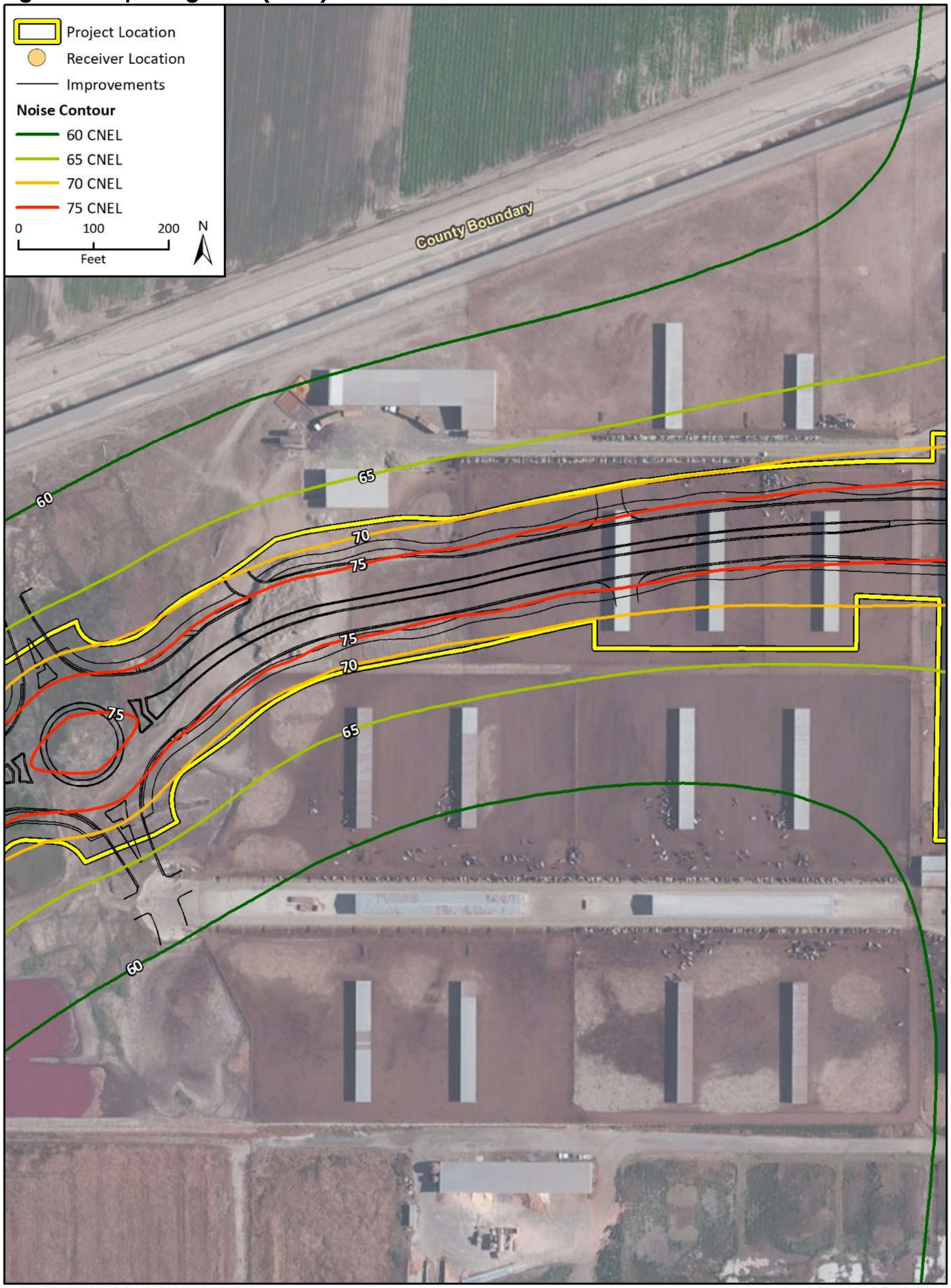

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Figure 7 Opening Year (2022) Noise Level Contours

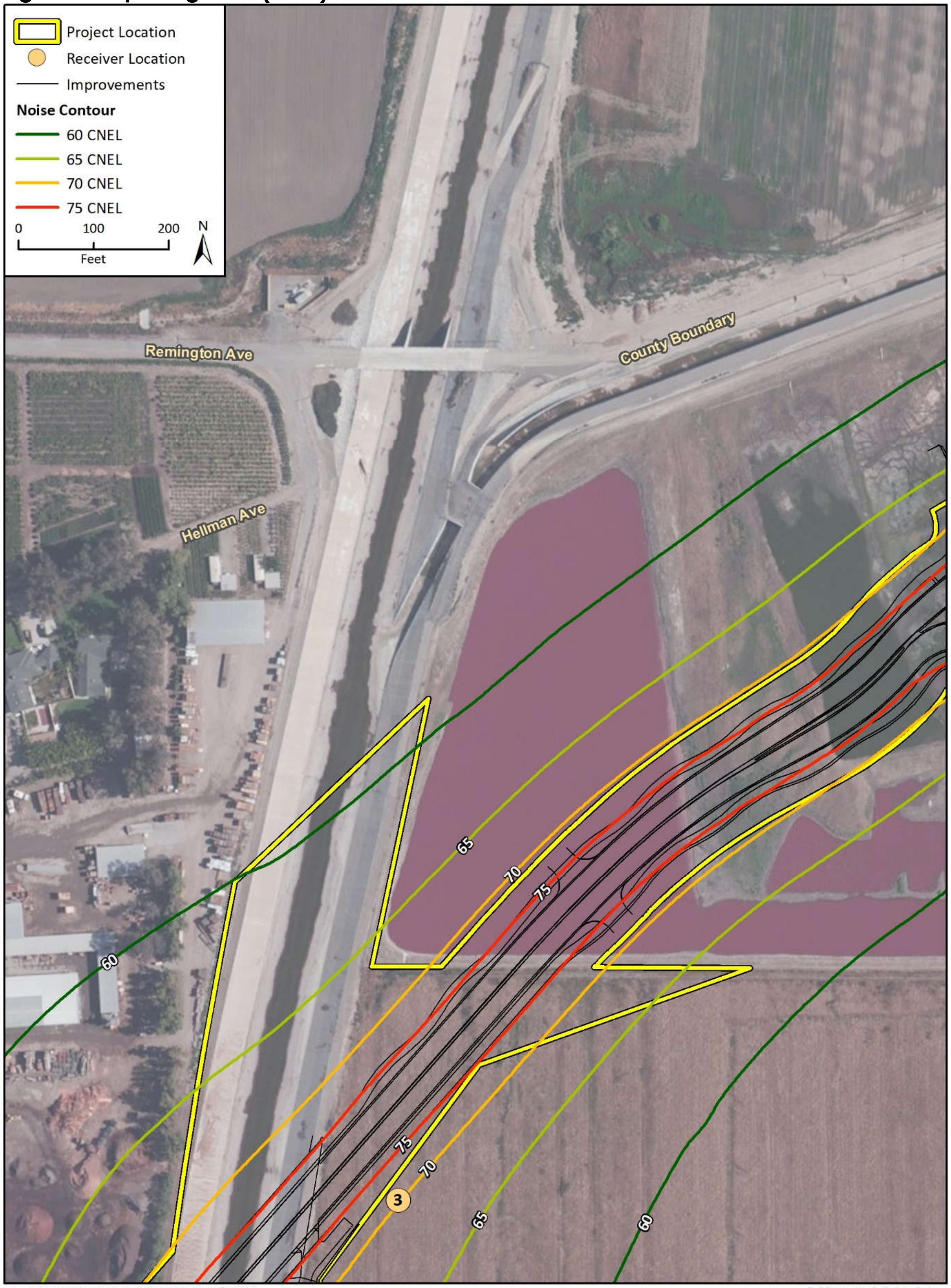

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Figure 8 Opening Year (2022) Noise Level Contours

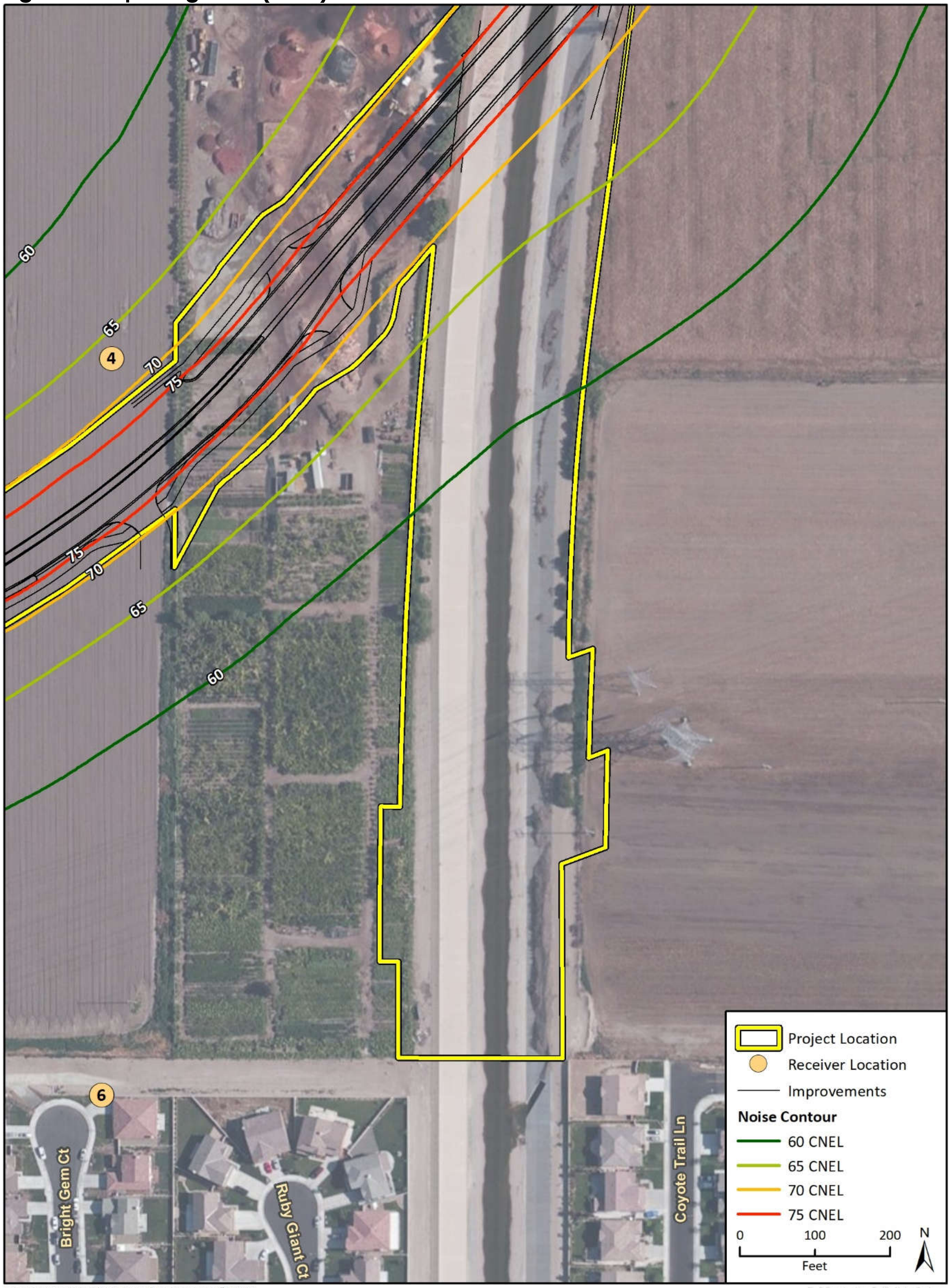

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Figure 9 Opening Year (2022) Noise Level Contours

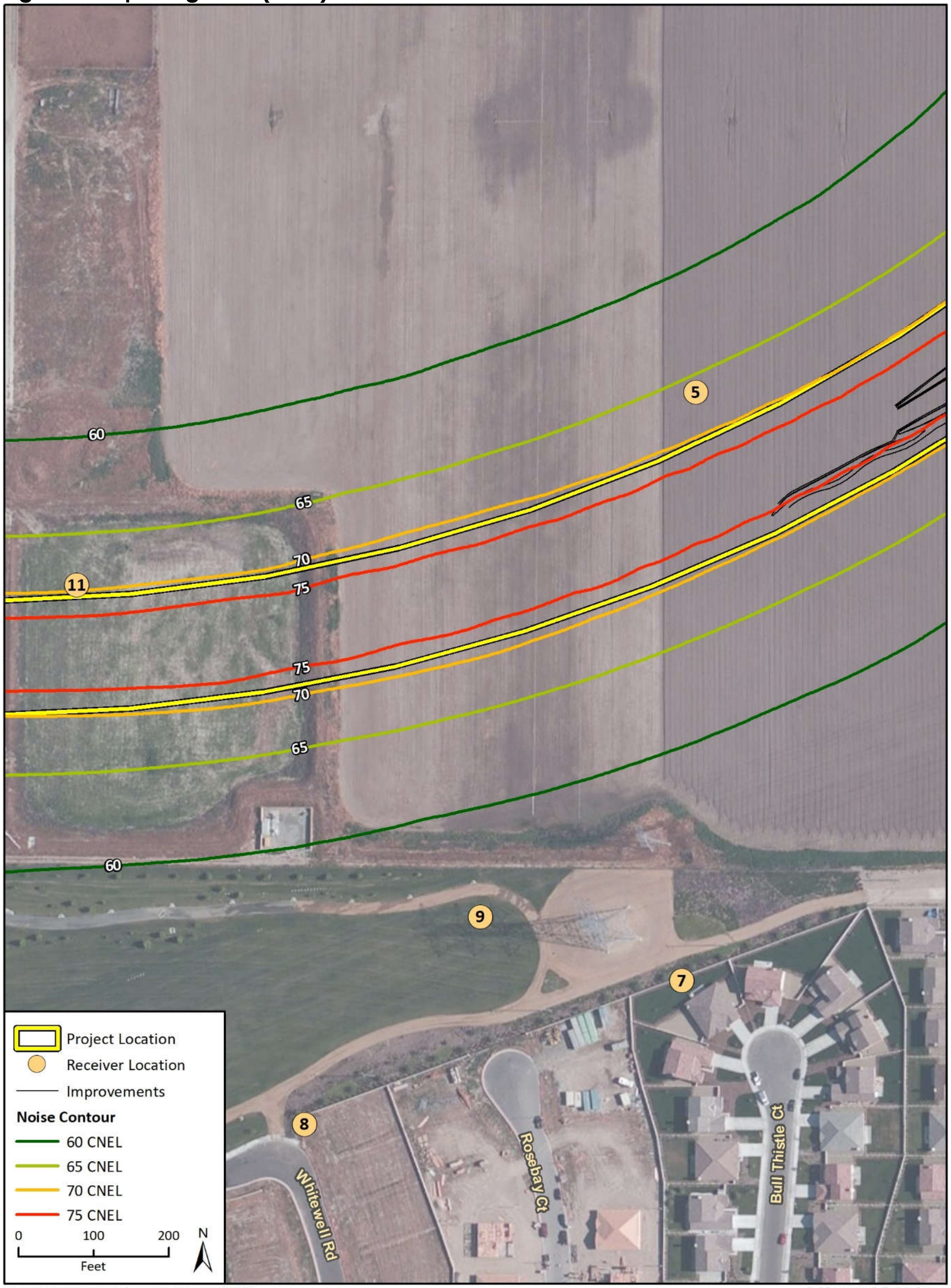

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Figure 10 Opening Year (2022) Noise Level Contours

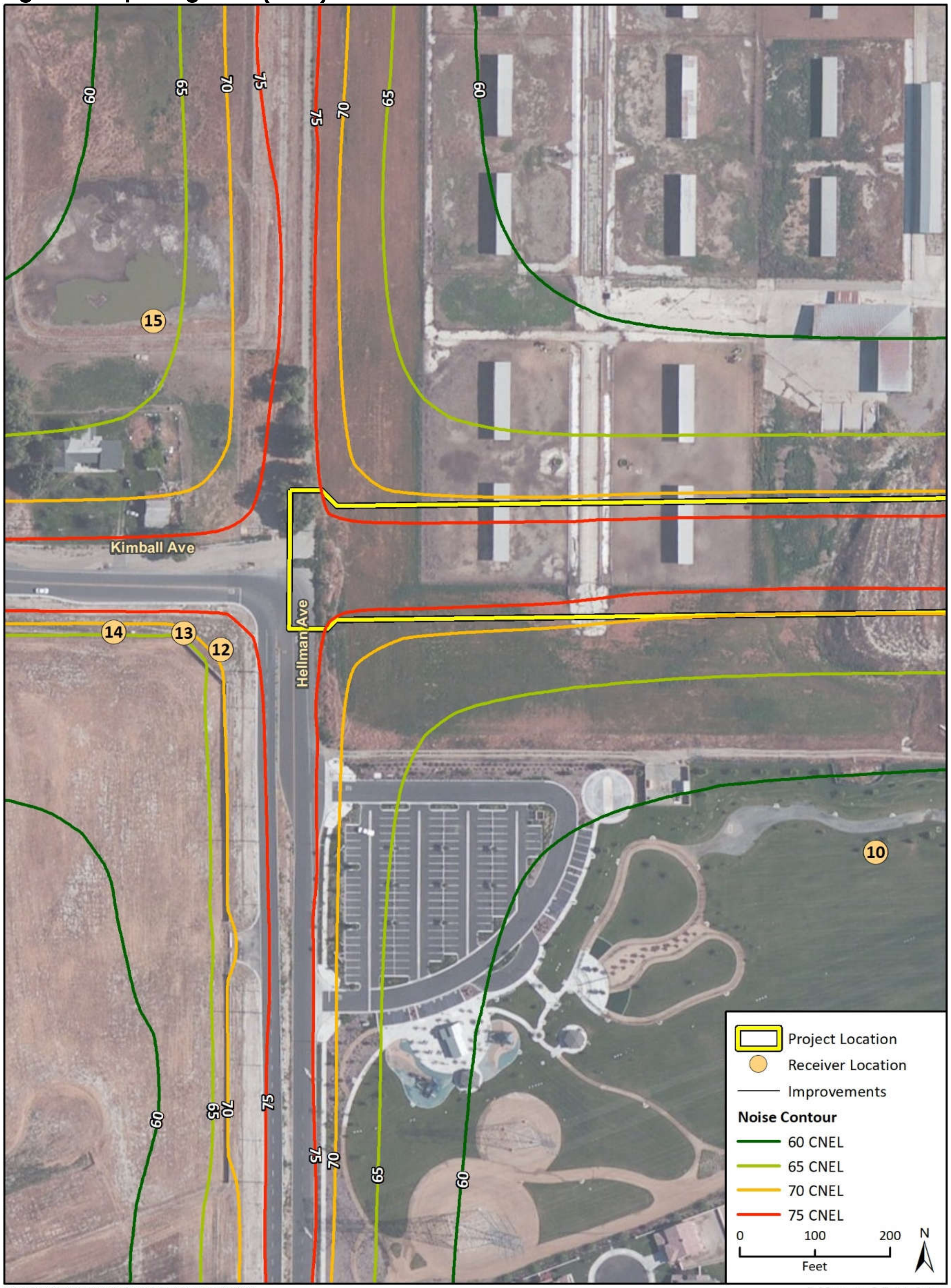

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Figure 11 Design Year (2024) Noise Level Contours

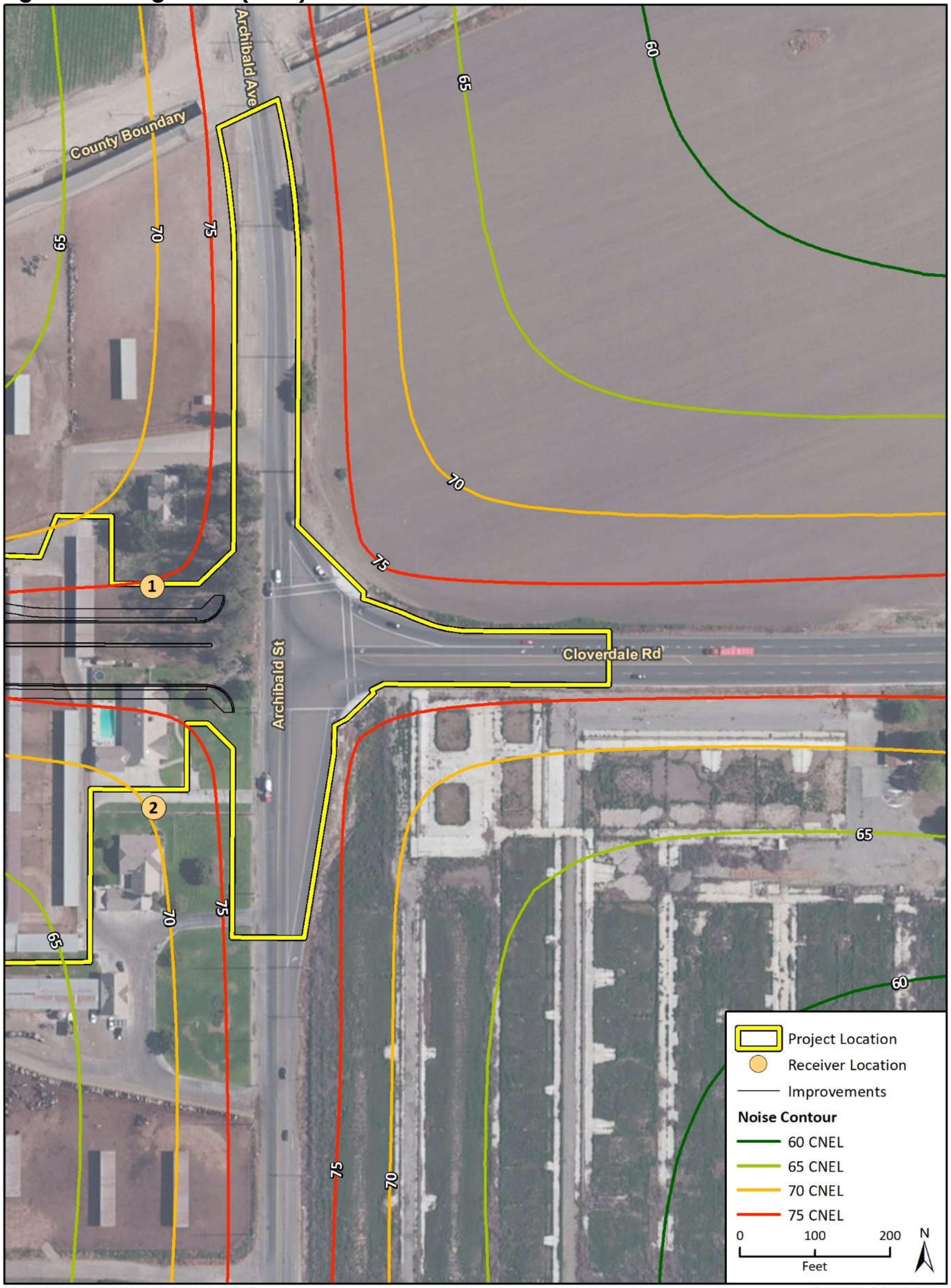

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Figure 12 Design Year (2024) Noise Level Contours

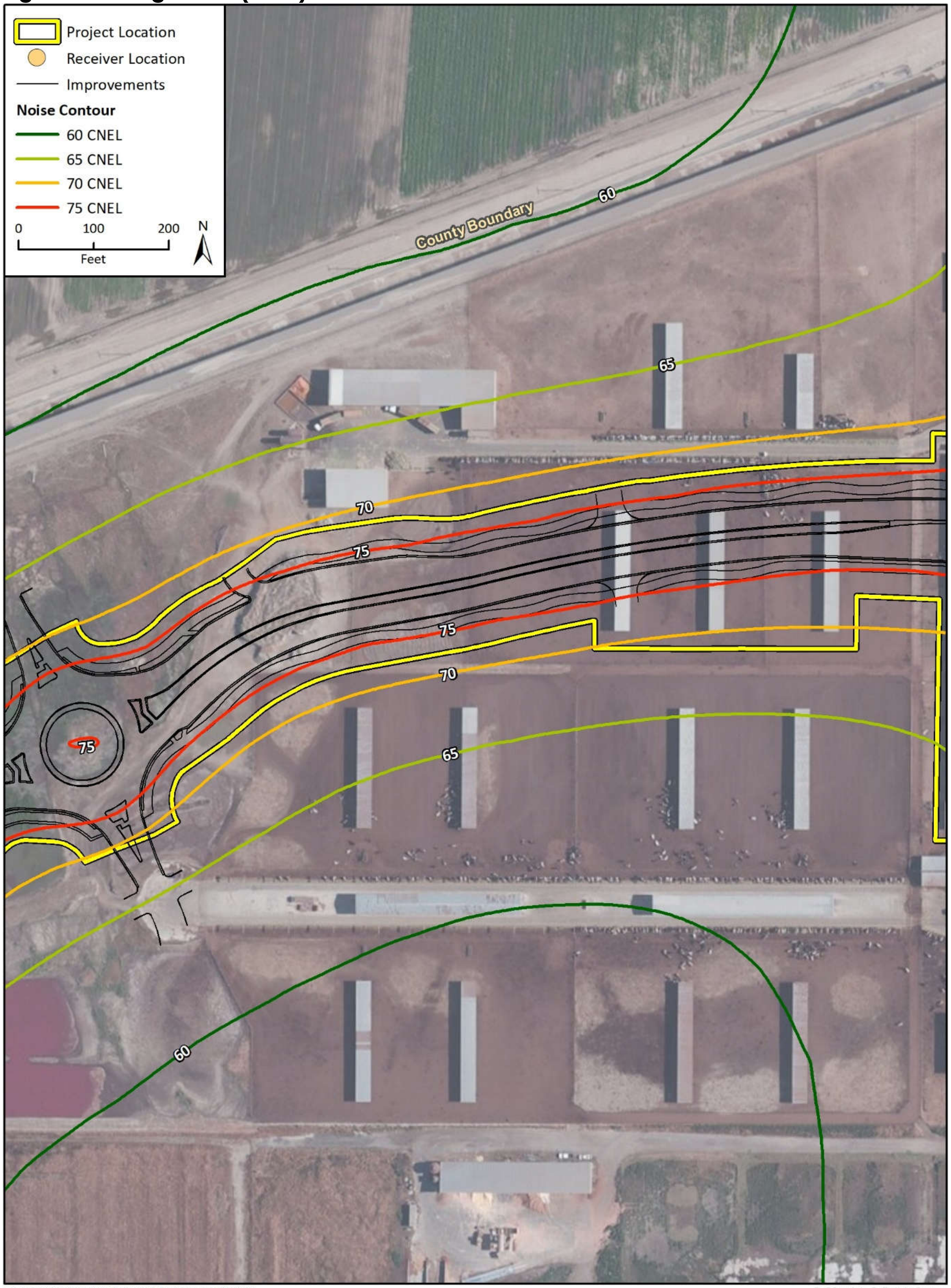

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Figure 13 Design Year (2024) Noise Level Contours

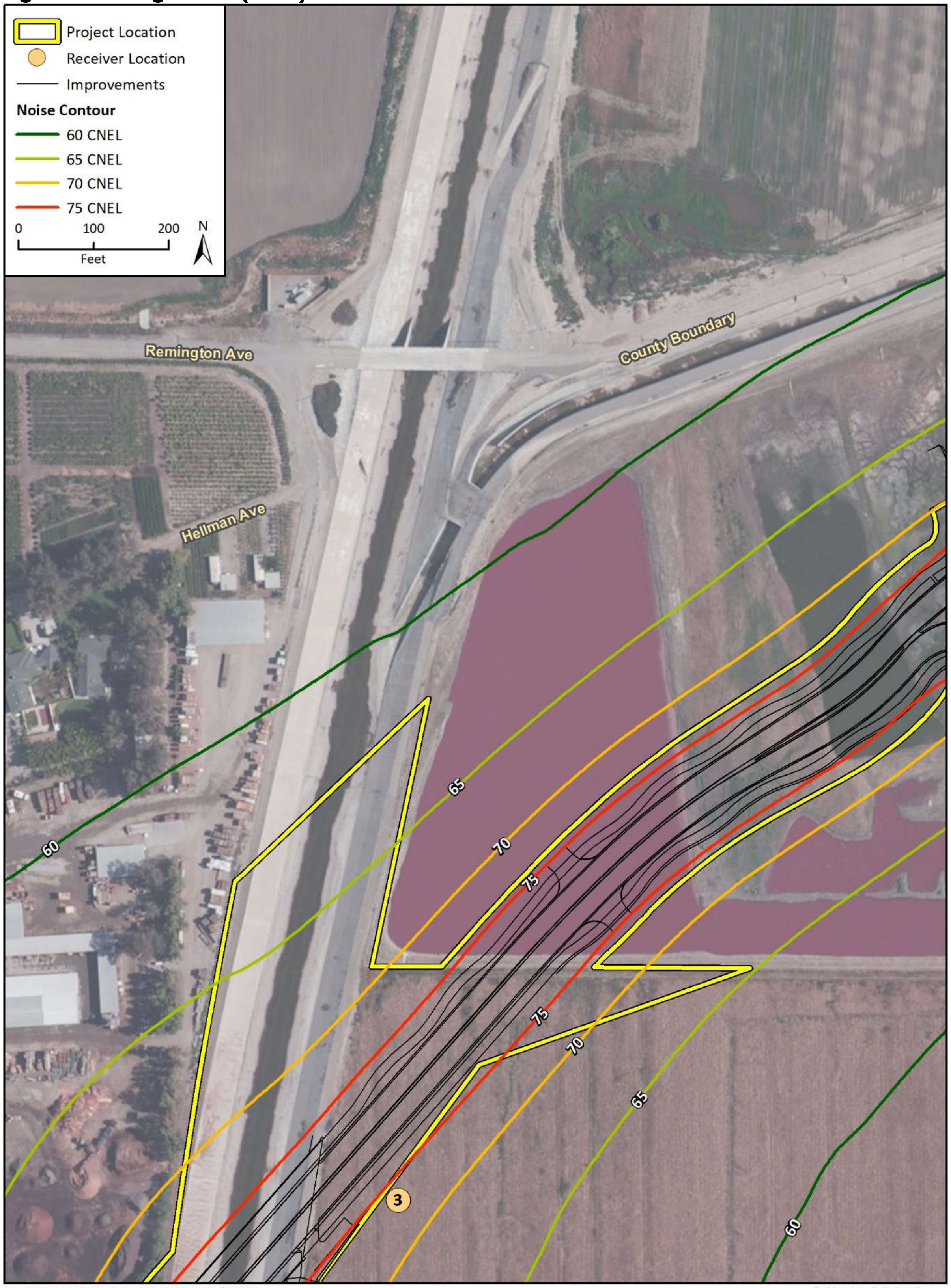

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Figure 14 Design Year (2024) Noise Level Contours

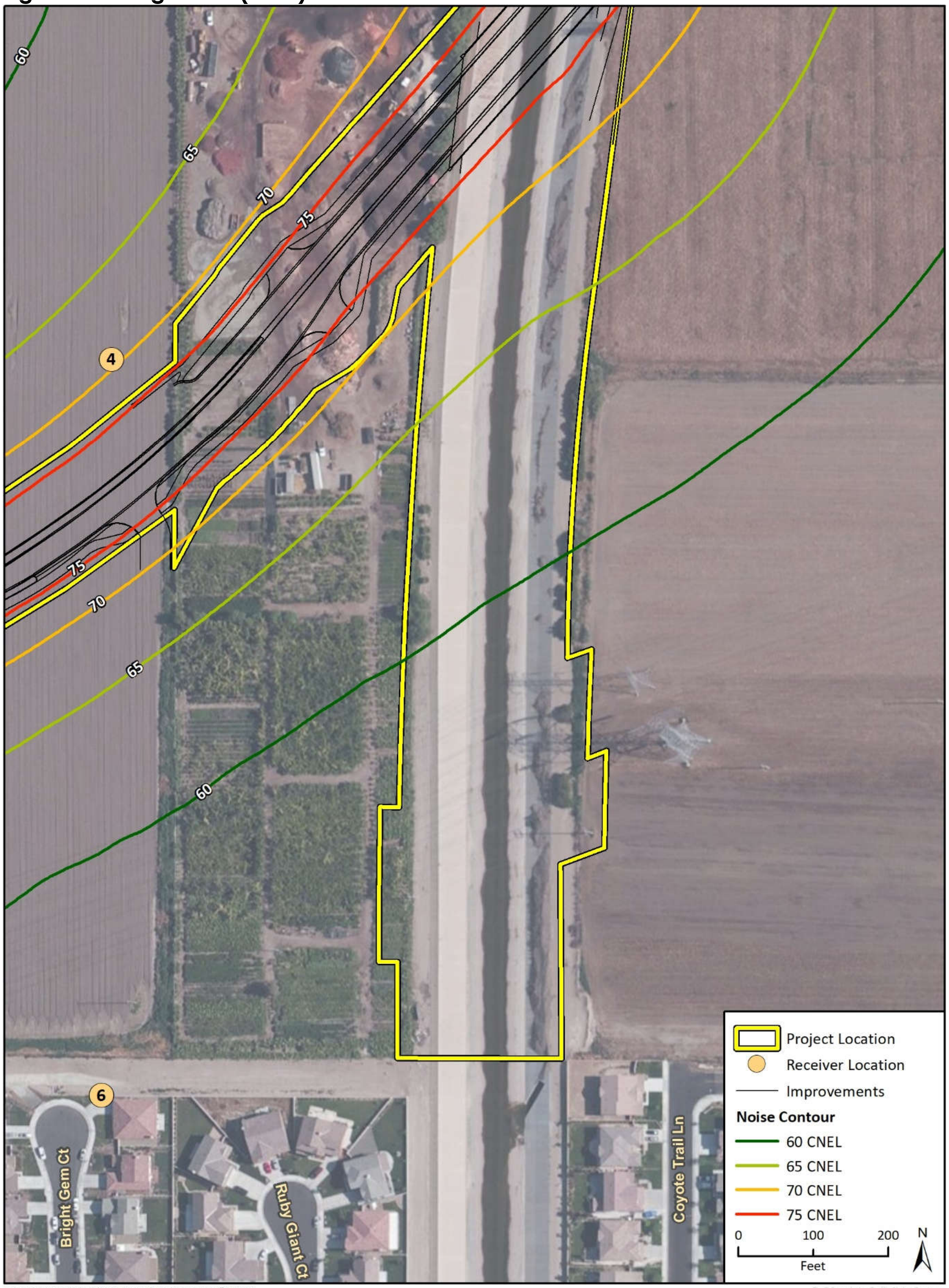

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Figure 15 Design Year (2024) Noise Level Contours

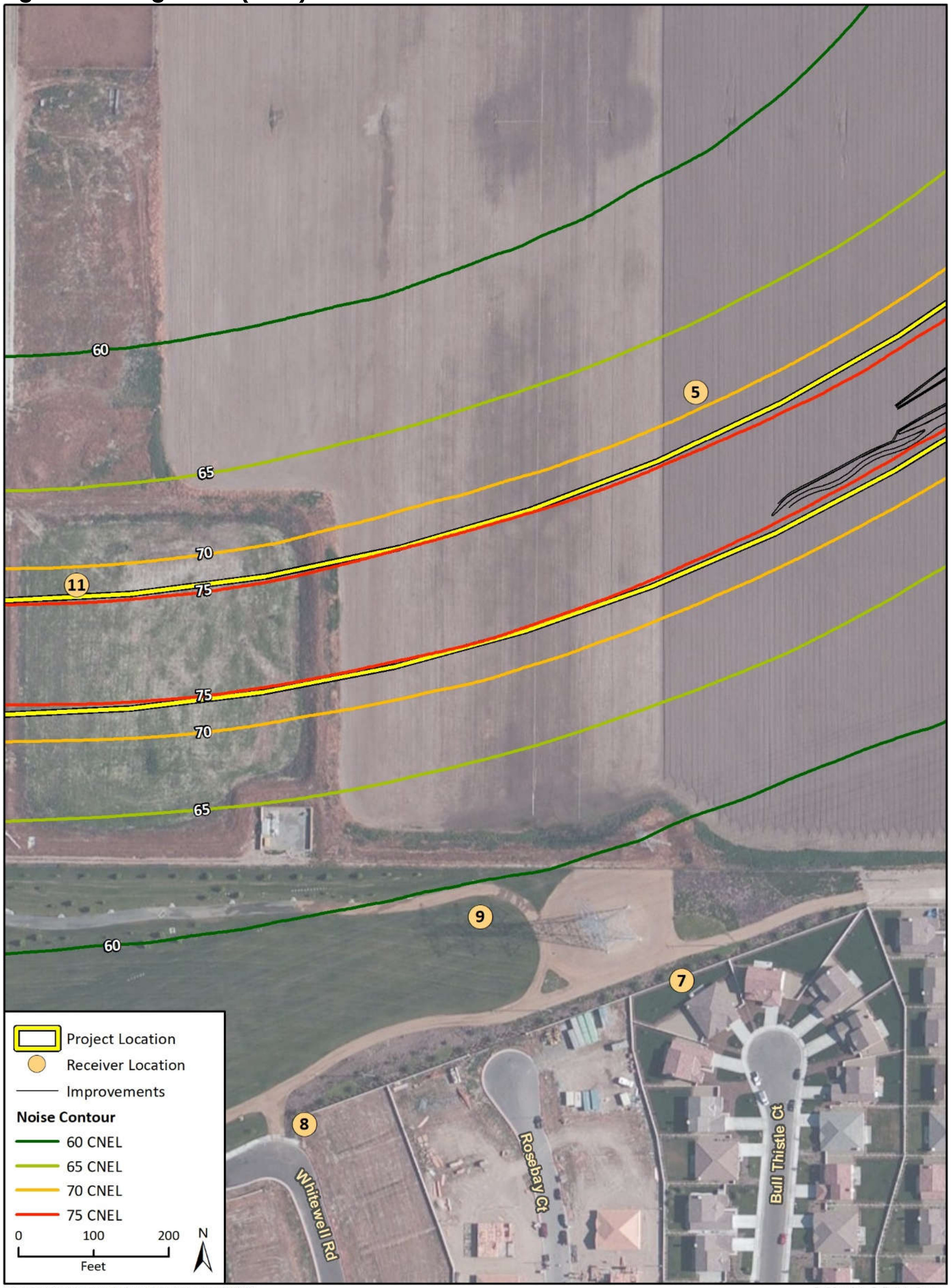

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Figure 16 Design Year (2024) Noise Level Contours

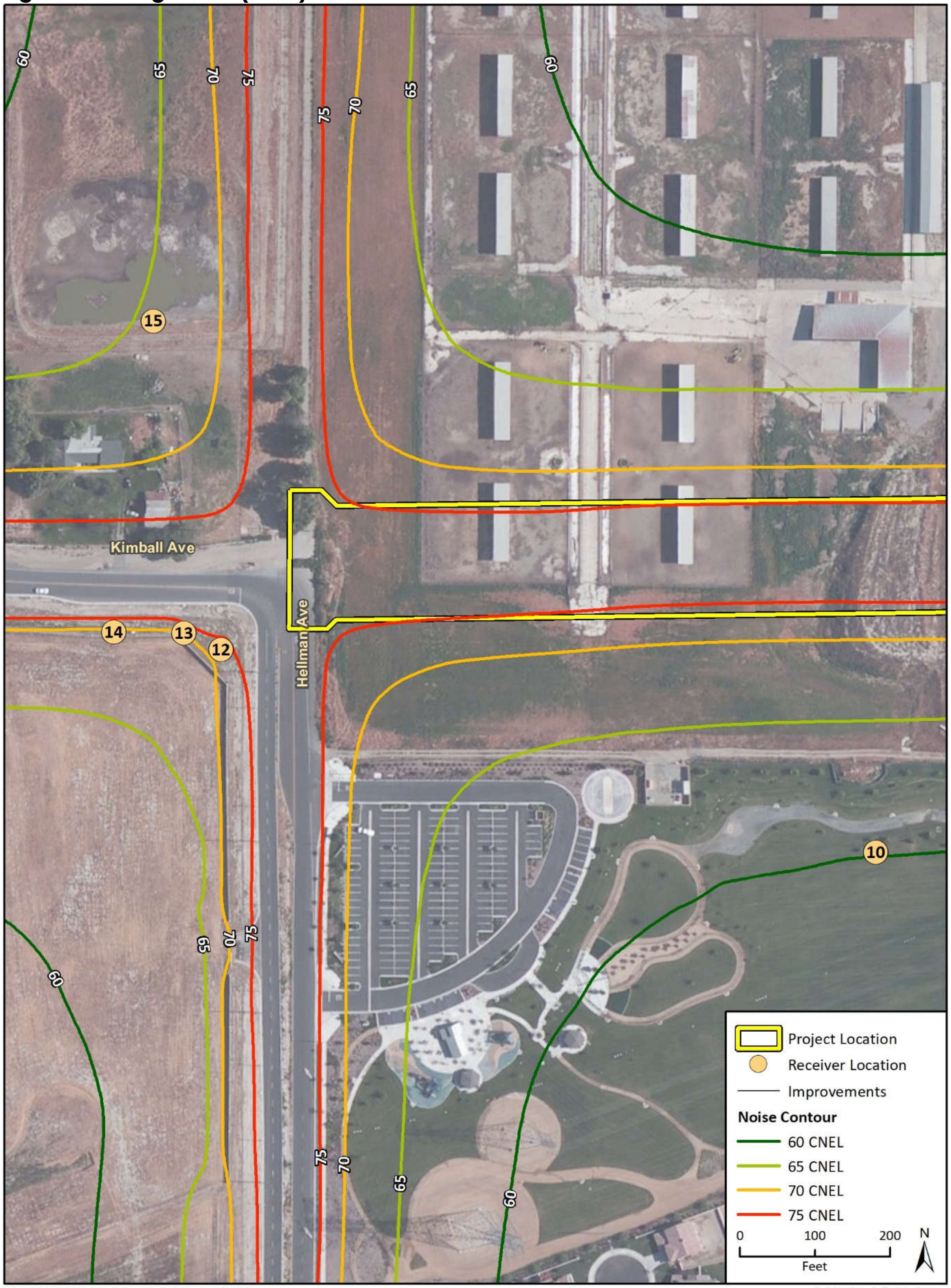

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Table 7 Traffic Noise Levels

Receiver	Land Use	Noise Level Limit*	Existing	Opening Year (2022)	Design Year (2042)
1	SFR	65	66	67	69
2	SFR	65	64	64	67
3	Comm.	75	49	70	73
4	Comm.	75	66	67	69
5	Comm.	75	68	66	69
6	SFR	65	52	53	56
7	SFR	65	54	54	57
8	SFR	65	53	54	57
9	Park	65	57	57	60
10	Park	65	58	59	61
11	Comm.	75	71	71	75
12	SFR	65	62	62	65
13	SFR	65	61	62	64
1114	SFR	65	62	62	64
15	Comm.	75	65	65	67

* Noise Limit Based on General Plan Tentatively Compatible Level.

4.2 Item 2 – Vibration

Item: Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels? *(Less Than Significant Impact)*

Construction activities known to generate excessive ground-borne vibration, such as pile driving, would not be conducted by the project. The greatest anticipated source of vibration during general project construction activities would be from an excavator, which may be used within 80 feet of the nearest off-site structure. A vibratory roller was used for the purpose of this analysis as they create the highest anticipated vibration levels during construction activities. A vibratory roller generates approximately 0.21 in./sec. PPV at a distance of 25 feet (Caltrans 2013b). This would equal a vibration level of 0.058 in./sec. PPV at 80 feet. This vibration level is lower than the City's threshold of 0.0787 in./sec. PPV. Therefore, temporary impacts associated with construction would be less than significant.

The project does not include any substantial vibration sources associated with operation. Therefore, operational vibration impacts would be less than significant.

4.3 Item 3 – Airport Noise

Item: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? *(No Impact)*

The Chino Airport is the nearest public airport, located approximately 1.25 miles to the northwest of the project site. According to the noise compatibility contours figure for the Chino Airport in the

Riverside County Airport Land Use Compatibility Plan Policy Document (Riverside County Airport Land Use Commission 2004), the project site is located outside the airport's 60 CNEL noise contour but within Safety Zone III of the airport. However, the project is a roadway and would not hinder or create obstructions to operations at the Chino Airport. Therefore, no substantial noise exposure from airport noise would occur to construction workers, or users of the proposed roadway, and no impacts would occur.

5 Conclusions

The project would generate both temporary construction-related noise and long-term noise associated with operation of the project. Construction noise not would exceed FTA noise standards at the nearby land uses, and impacts from construction noise would be less than significant.

Traffic would generate an increased noise levels at local properties, however, the predicted noise level increase would not result in an incompatible noise environment for the existing land uses. Thus, while noise level increases may be perceivable, the increases in noise levels would be less than significant.

The project would generate groundborne vibration during construction. Groundborne vibration would not exceed the applicable vibration threshold at the nearest structures, and construction-related vibration impacts would be less than significant.

The project site is outside the noise contours for the Chino Airport. Therefore, no substantial noise exposure would occur to construction workers, employees, or users of the project from aircraft noise.

Given the aforementioned, the project as designed would result in less than significant impacts and no mitigation is necessary.

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