CHEROKEE PFAS WATER TREATMENT FACILITY PRE-CONSTRUCTION NOISE ASSESSMENT

To: Kyria Bosma and Brian Gaddie – AE2S

From: Shelley Morton – Cerjan Acoustics

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Subject: Pre-Construction Noise Assessment

Date: October 12, 2026

In support of Cherokee Metropolitan District's 1041 permit application for the Cherokee PFAS Water Treatment Facility located in Ellicott, Colorado (El Paso County), a construction noise assessment was conducted to estimate noise levels at nearby receptors. The project involves multi-phased construction activities spanning from early 2027 through spring 2028 at the location shown in Figure 1. The purpose of this technical memorandum is to outline the anticipated construction phases, predict associated equipment noise levels, and demonstrate project compliance with state and county noise guidelines.

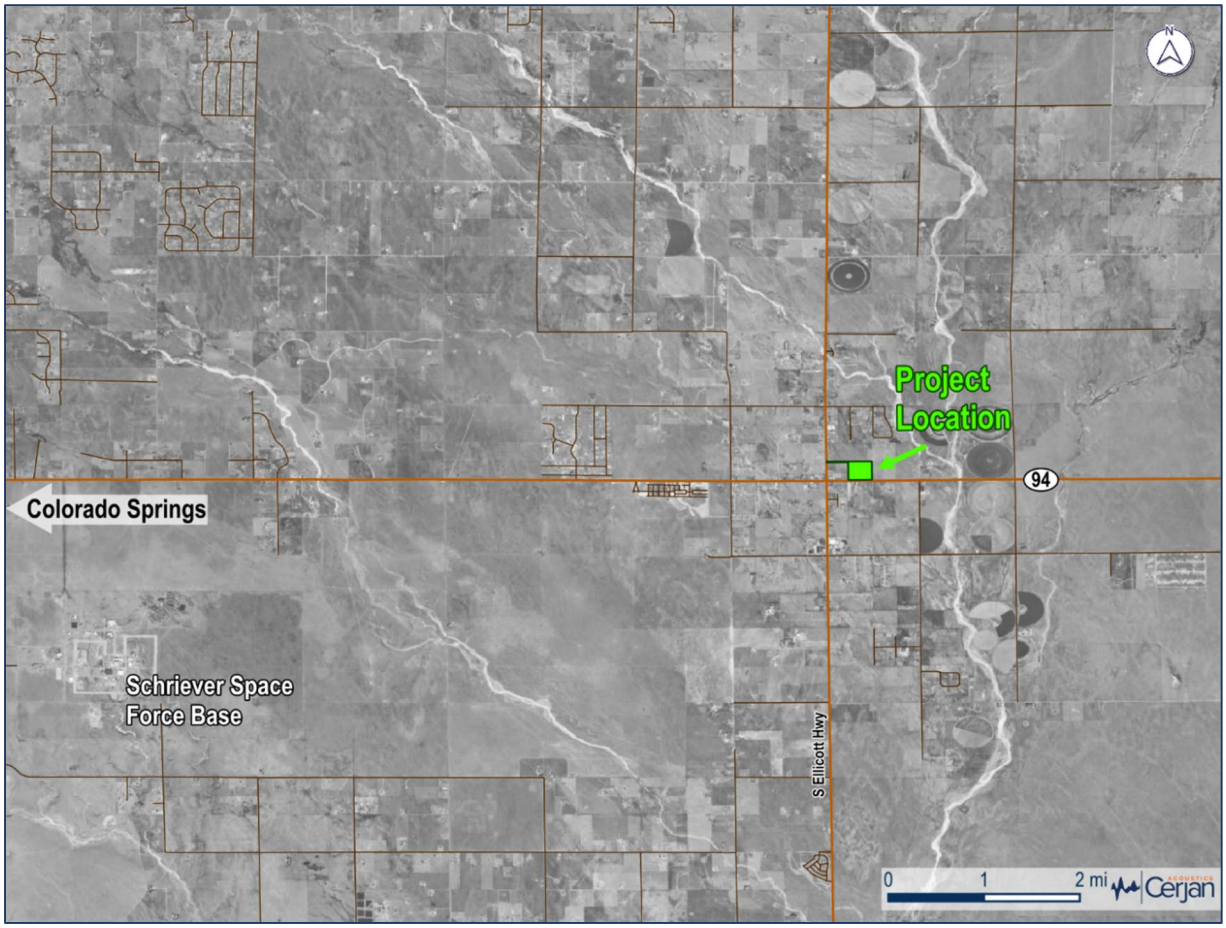


Figure 1 – General Location of the Project

DESCRIPTION OF THE SITE AND SURROUNDING AREA

The project is located in Ellicott, Colorado, within unincorporated El Paso County. The project site is primarily surrounded by agricultural land, with a small industrial plot and a Planned Unit Development (PUD) located to the southwest, buffered by intervening agricultural parcels. The nearest sensitive receptor is located approximately 150 feet from the site boundary and 300 feet from the estimated edge of active construction activities as shown in Figure 2.

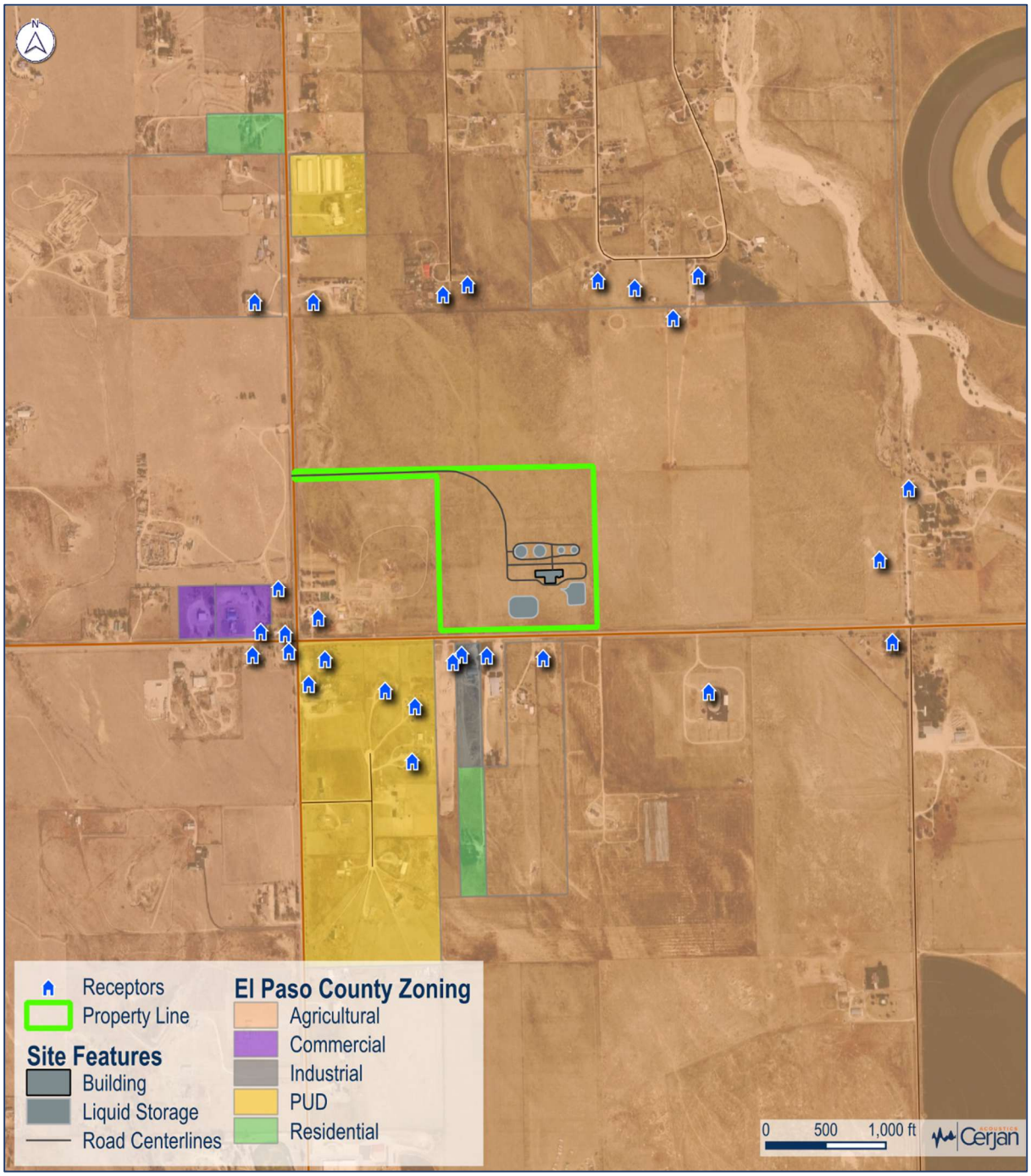


Figure 2 – Proposed Site of Cherokee PFAS WTF and Surrounding Areas

please update report throughout w 55dba; this is agricultural zoned property, not industrial zoned property

APPLICABLE NOISE REGULATIONS

Noise limits for this project are governed by El Paso County Ordinance No. 2002-1 and the State of Colorado Revised Statutes (CRS), Title 25, Article 12, Noise Abatement. The county ordinance directly aligns with state statutes, stipulating that temporary construction activities are subject to industrial zone limits regardless of adjacent property base zoning.

Because project operations will be limited exclusively to daytime hours (7:00 am to 7:00 pm), the applicable daytime construction noise limit is 80 dBA. This limit establishes the compliance boundary, applied 25 feet outside the property boundary or at the nearest sensitive receptor.

this is agricultural zoned property so its actually 55dba

Table 1 – El Paso County Ordinance No. 2002-1 — Maximum Permissible Noise Levels

Land Uses	Daytime[1][2] (7:00 am – 7:00 pm)	Nighttime[2] (7:00 pm – 7:00 am)
Residential or Commercial	55 dBA	50 dBA
Industrial area or Construction Activities	80 dBA	75 dBA
Non-specified areas	55 dBA	50 dBA

[1] During the daytime, noise levels can be increased by 10 dBA for 15 minutes in any one-hour period
[2] Noise level limit decreases by 5 dBA for intermittent, shrill-type sounds

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Land Use

As the Project property itself is considered Industrial during construction activities, the Project shall limit noise to 80 dBA at a location 25 feet outside the Project property boundary.

Type of Operation

The type of operation affects these limits in three ways. First, during the daytime, the noise level limit can be increased by 10 dBA for 15 minutes in any one-hour period to account for intermittent operational sources. Second, noise level limits are reduced by 5 dBA for impulsive or shrill-type sounds, which applies to standard tonal backup alarms but not to ambient-controlled broadband backup alarms that are non-impulsive. Third, construction activities are subject to the industrial zone limits per CRS §25-12 and El Paso 2002-1 regardless of whether adjacent properties carry lower limits due to their base land use.

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Summary of the Applicable Noise Limits

Overall, the project noise levels shall remain at or below the industrial daytime limit of 80 dBA at a location 25 feet outside its boundary. At the same time, the contractor shall remain mindful of adjacent residential areas where permanent operations align with a 55 dBA daytime limit, though temporary construction is governed by the 80 dBA industrial threshold. State statutes permit daytime noise levels to increase by 10 dBA for up to 15 minutes in any one-hour period for intermittent events.

CONSTRUCTION PHASING AND EQUIPMENT

To evaluate peak potential noise output across the project duration, representative equipment fleets encompassing heavy earthmoving, structural concrete work, and material handling were compiled. Passenger vehicles for on-site personnel and standard delivery vehicles were excluded from the noise modeling scope.

Reference sound levels (L_{max} at 50 ft) and usage factors were sourced from the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) database. Table 2 outlines the cumulative equipment inventory utilized to establish the overall project noise profile.

Table 2 – Expected Construction Equipment Inventory

Primary Phase	Equipment Type	Units on Site	L_{max} at 50ft	Usage Factor (%)
Site Prep/ Civil	Dozer (D6)	1	85	40%
	Grader (140M)	1	85	40%
	Loader (950)	1	80	40%
	Excavator (329)	1	85	40%
	Backhoe (420)	1	80	40%
	Skidsteer Loader (226)	1	80	40%
	Compactor CS VIB 433	1	80	20%
Structural/ Piping	Forklift RT 10K# Reach	2	85	20%
	Forklift WH 5.5K#	1	85	20%
	Crane 90T RT	1	85	16%
	Crane 45T	1	85	16%
Intermittent/ Pour days	36M Concrete Pump	1	81	20%
	39M Concrete Pump	1	81	20%
	Concrete Truck	1	85	20%

NOISE LEVEL PREDICTION METHODOLOGY

Noise levels were predicted using the FHWA Traffic Noise Model (TNM) version 3.2, incorporating standardized construction equipment sound emission databases. To evaluate a conservative, worst-case instantaneous scenario, equipment sound levels were modeled utilizing peak maximum emission levels (L_{max}) ranging from 80 to 85 dBA, conservatively assuming a maximum level of 85 dBA. Meteorological parameters within the model were set to standard acoustic baselines of 10°C, 70% relative humidity, and 1 atmosphere to minimize atmospheric absorption and simulate optimal sound propagation. Topographical elevation data and site grading were modeled using project-specific design files and USGS topographical layers, applying standard

ground attenuation factors characteristic of hard-packed soil. Prediction points and noise contours were evaluated at a height of 5 feet above the ground surface.

NOISE LEVEL RESULTS AND ASSESSMENT

An array of reference receptors was modeled radially around the construction footprints to evaluate compliance with the 80 dBA daytime industrial threshold. The loudest equipment of 85 dBA at 50 feet was used in the modeling. To establish a robust and conservative baseline representative of overall project operations, a worst-case scenario was modeled utilizing the single loudest piece of equipment operating near the perimeter edge of the expected construction zone.

This worst-case 80 dBA noise contour remains within the "project property line plus 25 feet" boundary. A public roadway lies immediately to the south of the project which is exempt from noise limits; therefore, this 25-foot measurement boundary was extended 25 feet into the parcel adjacent to and south of the roadway. This modeling approach serves as a reliable representation for the project as a whole, because the simultaneous operation of multiple heavy pieces of equipment running continuously along the absolute edge of the boundary is highly unlikely during normal construction sequencing. Furthermore, state regulations permit daytime noise levels to increase by 10 dBA for up to 15 minutes in any one-hour period. Consequently, even if localized operations temporarily reach or exceed baseline expectations, the duration is anticipated to remain well within the statutory 15-minute allowance, ensuring compliance with applicable limits.

The project is primarily surrounded by agricultural land, with a small industrial plot and a Planned Unit Development (PUD) located to the southwest, separated by intervening agricultural parcels.

While worst-case modeling sound levels are encountered at the property line plus 25 ft boundary, as shown in Figure 3, the actual noise levels are expected to be lower. The model assumes uninterrupted operation, whereas real-world construction is inherently intermittent (usage of 40% or less per hour). Peak high-noise activities (such as concrete truck deliveries, estimated at 15 total days across the project) are temporary.

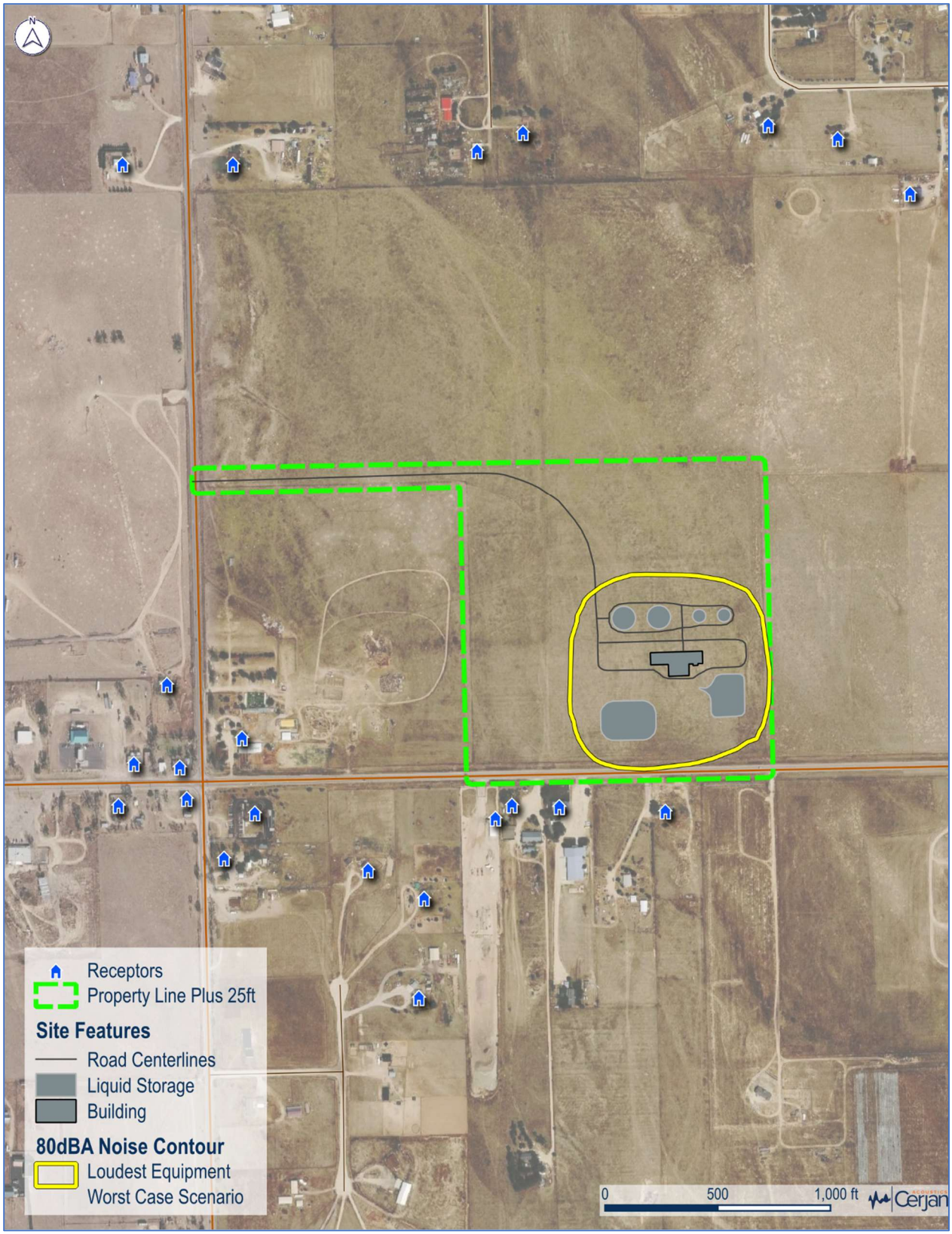


Figure 3 – Predicted Worst-Case Noise Level Contours for Loudest Piece of Equipment

RECOMMENDED NOISE MITIGATION MEASURES

To maintain compliance with applicable limits and minimize community friction, the following best management practices are recommended:

- **Community Communication & Outreach:** Proactive communication will build goodwill for the project. It is recommended that project management personally introduce themselves to the neighbors residing at Receptors directly south and to the west of the project to establish an open line of communication regarding the schedule of loud, temporary activities (such as the 15 specific days of concrete truck operations). Provide a direct contact or 24-hour complaint line to these residents.

- **Backup Alarms:** One common cause of noise complaints is the intermittent and tonal nature of standard backup alarms. It is recommended to replace these tonal alarms with ambient-controlled broadband backup alarms on heavy equipment to minimize off-site noticeability and avoid impulsive/shrill noise penalties.

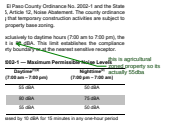
- **Equipment Location:** Locate stationary equipment (e.g., concrete pumps, light plants, generators) as far from the property boundary as physically feasible.

- **Operational Controls:** Enforce behavioral protocols, such as minimizing tailgate slamming, and utilizing temporary acoustic blankets (e.g., Echo-Barrier panels) if work is to occur immediately adjacent to a boundary.

ADD summary statement that operational plant will operate at ____dba (55dba max at property lines)

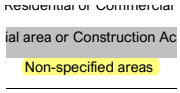
V1_Noise Study.pdf Markup Summary

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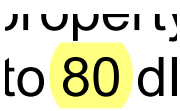
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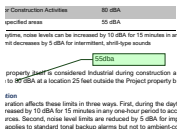
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Non-specified areas



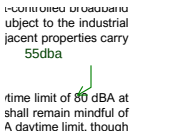
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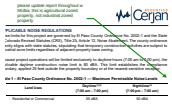
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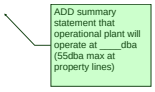
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please update report throughout w 55dba; this is agricultural zoned property, not industrial zoned property



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