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Subject: ***Hermantown Industrial Noise Assumptions and Report***
Hermantown, Saint Louis County, Minnesota

Kimley-Horn modeled and analyzed the noise emission levels from the proposed operational equipment at the Hermantown Industrial site. The Hermantown Industrial site is expected to consist of four (4) buildings, which will include air-cooled chillers at each building, and back up emergency generators at each building. Note that the proposed generators are only expected to operate during phased maintenance and testing as well as during emergency conditions.

Project Noise Targets

The State of Minnesota regulates industrial operations standards in Chapter 7030 of the Minnesota Administrative Rules (https://www.revisor.mn.gov/rules/7030). The chapter establishes the thresholds in **Table 1**.

Minnesota law permits the Minnesota Pollution Control Agency (MPCA) to enforce the State's noise rules; however, the enforcement of noise rules are generally conducted at the local level. For this project, the city of Hermantown has adopted the state noise standards into ordinance and are the responsible entity for enforcing these rules. Per the city zoning code (Chapter 5, Land Use Regulations) all sound levels inside and outside of all buildings must meet federal, state, and local requirements. The zoning code does not require noise modeling be provided for non-baseline conditions when the backup generators are running during a blackout.

Table 1. Noise Thresholds

Noise Area Classification (NAC)	NAC #	Daytime/Nighttime	
		L_{10}	L_{50}
Residential housing, religious activities, camping and picnicking areas, health services, hotels, educational services	1	65/55	60/50
Retail, business and government services, recreational activities, transit passenger terminals	2	70/70	65/65
Manufacturing, fairgrounds and amusement parks, agricultural and forestry activities	3	80/80	75/75
L_{10}: sound level, in dBA, which is exceeded ten percent of the time for a one-hour survey **L_{50}:** sound level, in dBA, which is exceeded fifty percent of the time for a one-hour survey			

The adjacent townships of Solway, Midway and Thomson as well as Saint Louis County do not have any applicable noise regulations. Carlton County, 3000 feet to the southwest, requires compliance with the Minnesota Administration Rules.

Existing Noise Contributions

The combination of traffic noise from nearby roadways, as well as various commercial and residential activity, were observed to contribute to the existing noise levels throughout the entire day at the residences surrounding the proposed site.

The predominant sources of noise, in the vicinity of the Hermantown IndustrialHermantown Industrial site, were observed to be traffic along Morris Thomas Road and Midway Road. Other sources of noise included environmental noise, which includes wind, birds chirping, insects, etc. Also, commercial land uses, such as a butcher shop, liquor store, and sodding company, are located north and northeast of the project area.

To assess existing noise conditions near the Hermantown Industrial site, two (2) long-term noise measurements were collected for 24-hour durations from May 12, 2025, to May 13, 2025. Two (2) Larson Davis LxT Type I Precision Integrating Meters were set up in the vicinity of the Hermantown Industrial site: one near the northern extent of the Hermantown Industrial site, approximately 100 feet south of Morris Thomas Road and the other southeast of the Hermantown Industrial site, approximately 150 feet west of Midway Road. Long-term noise measurement hourly L_{eq} values obtained in the field ranged between approximately 47 dB(A) and 65 dB(A). A summary of the measured long-term noise data is shown in **Table 2**.

Table 2. Noise Measurement Data

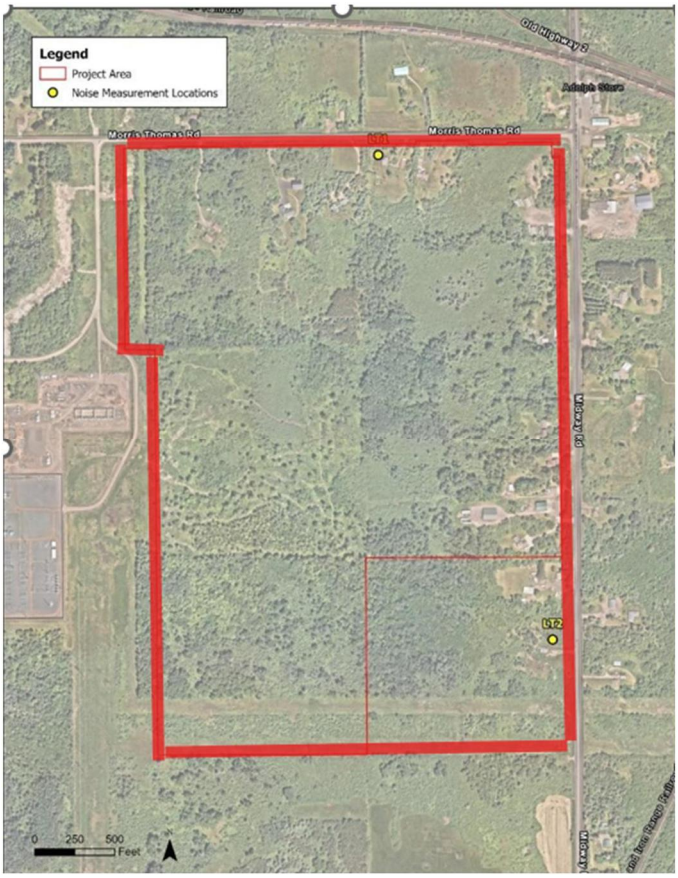
Setup	Location Description	Measurement Time	24-hr L_{eq} Noise Level [dB(A)]	Average Daytime L_{eq} Noise Level [dB(A)]	Average Nighttime L_{eq} Noise Level [dB(A)]	Maximum Hourly L_{eq} Noise Level [dB(A)]
LT1	Northern portion of the Hermantown Industrial site, approximately 100 feet south of Morris Thomas Road.	10:00 AM (5/12) – 10:00 AM (5/13)	60.0	60.2	59.7	63.3
LT2	Southeast of the Hermantown Industrial site, approximately 150 feet west of Midway Road.	10:30 AM (5/12) – 10:30 AM (5/13)	59.0	58.9	59.0	65.1

The measurements were taken using the A-weighted scale and are reported in decibels [dB(A)]. Data collected by the noise meters included time, average noise level (L_{eq}), maximum noise level (L_{max}), and instantaneous peak noise level (L_{pk}) for each interval. Hourly average noise levels ($L_{eq(h)}$) were derived from the L_{eq} values. The existing noise measurements were collected under meteorologically acceptable conditions and were conducted based on the acceptable collection of existing noise level readings. The locations of the monitoring sites are shown in **Figure 1**, and pictures of the field monitoring setups are shown in **Table 3**.

Table 3. Existing Noise Measurement Locations

LT1: Facing East	LT2: Facing East
	

Figure 1. Map of Existing Noise Measurement Locations



Modeling Assumptions and Methodologies

Kimley-Horn modeled the Hermantown Industrial site using the assumptions in **Table 4**:

Table 4. Modeling Assumptions and Methodologies

Modeling Software	SoundPLANessential 5.1
Modeling Standard	ISO 9613-2 - Acoustics - Attenuation of Sound During Propagation Outdoors - Part 2: General Method of Calculation
Terrain	Flat model assumed given the minimal amount of elevation change at and around the site
Structures	On-site buildings included in the model to account for shielding. Off-site buildings and privacy barriers included in the model to account for shielding.
Ground Factor	Ground modeled as 10% absorptive.
Foliage	Foliage not modeled.
Meteorology	Downwind conditions assumed for all modeled noise-sensitive receptors.
Temperature	10 degrees Celsius modeled.
Relative Humidity	65% relative humidity modeled.

Table 5 summarizes the modeled noise levels associated with the proposed sound generating equipment that is assumed at each building.

Table 5. Sound Generating Devices

Sound Generating Devices	Notes	Noise Level
Generator Outlet	Outlet modeled on grade as top of stack (Approx. 20 ft height)	Sound pressure level of approximately 85 dB(A) at 1m or 60 dB(A) at 50 ft
Air-Cooled Chillers (ACC)	ACC modeled at Approx. 10' feet above assumed platform	Sound power levelof approximately 100 dB(A)

Project Layout and Equipment Counts

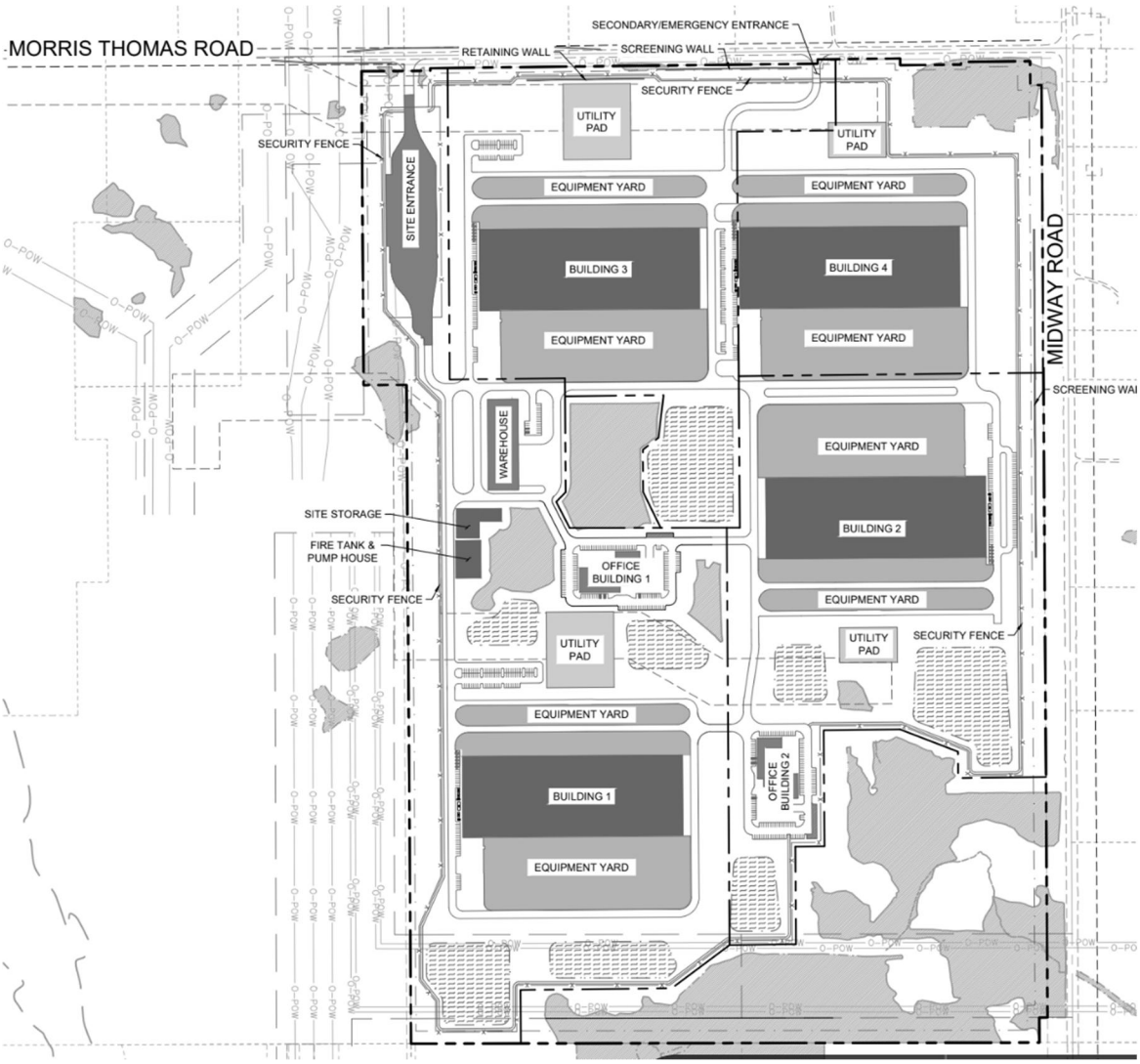
The current layout consists of four buildings and various miscellaneous site uses. The currently proposed site plan is shown in **Figure 2**.

The currently proposed buildings is assumed to consist of the following equipment:

- Building 1
  - Approximately 100 ACCs
  - Approximately 30 Generators within Northern Equipment Yard
  - Approximately 10 Generators within Southern Equipment Yard
- Building 2
  - Approximately 100 ACCs
  - Approximately 30 Generators within Southern Equipment Yard
  - Approximately 10 Generators within Northern Equipment Yard

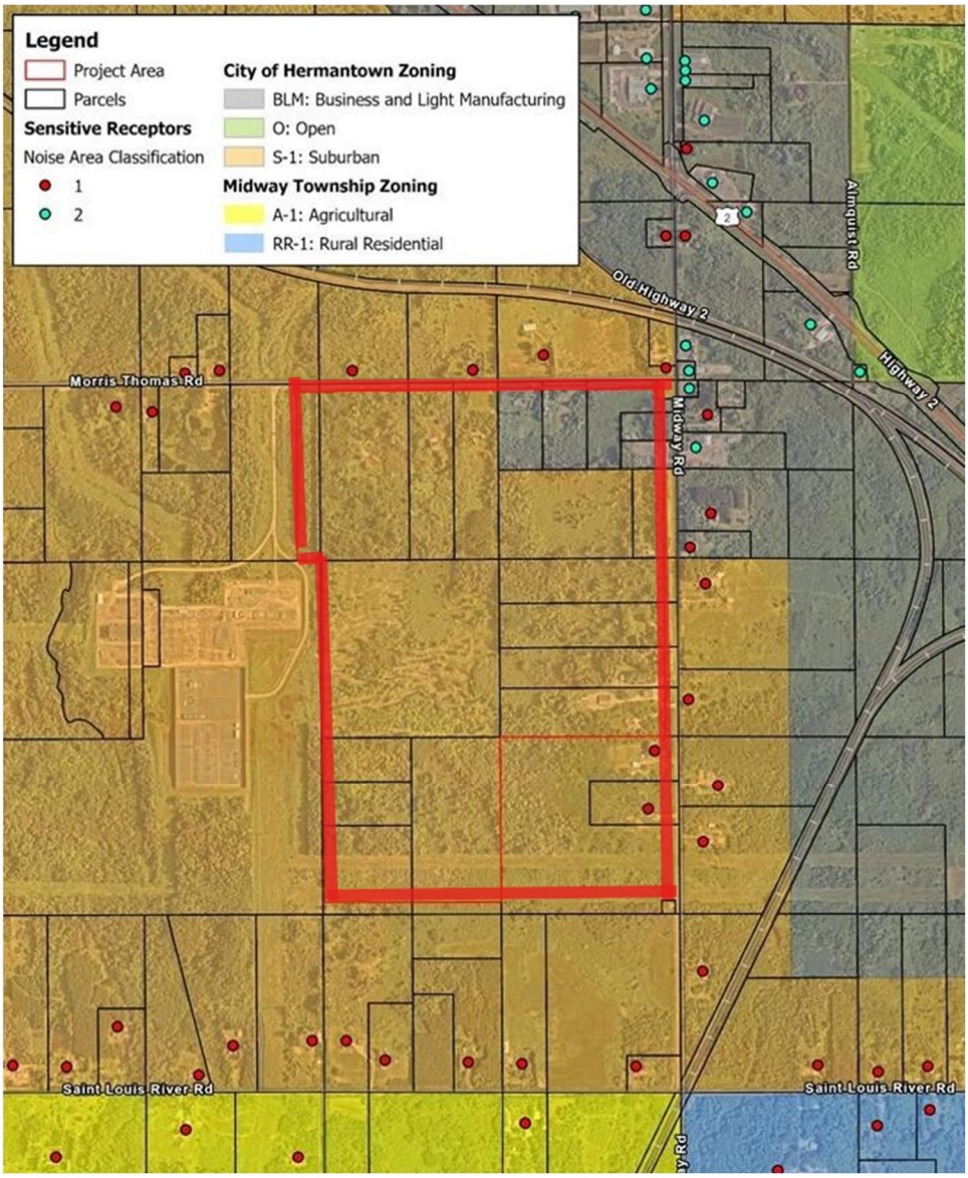
- Building 3
  - Approximately 100 ACCs
  - Approximately 30 Generators within Northern Equipment Yard
  - Approximately 10 Generators within Southern Equipment Yard
- Building 4
  - Approximately 100 ACCs
  - Approximately 30 Generators within Northern Equipment Yard
  - Approximately 10 Generators within Southern Equipment Yard

Figure 2. Proposed Site Plan



Kimley-Horn has prepared a map of noise-sensitive receptors near the Hermantown Industrial site, see **Figure 3**. The Hermantown Industrial site and surrounding parcels are in suburban as well as business and light industrial zones, according to the city of Hermantown zoning map. Please note that the underlying zoning map depicted in the figure below has was been amended by the City of Hermantown and the parcels to the west of the project area that are owned by Minnesota Power have since been rezoned to BLM.

Figure 3. Noise Sensitive Receptors[1]



[1] The project study area is expected to be rezoned for Business and Light Manufacturing

Modeled Scenarios

The following model scenarios were analyzed for this study:

- Assumed Phase I operation (normal) – This model includes Building 1
  - Typical Operations
- Full-Buildout operation – This model includes Building 1, Building 2, Building 3, and Building 4
  - Typical Operations
    - With abatement
    - Without abatement

Results

Utilizing the input data described above, SoundPLAN was used to calculate anticipated operational noise levels at the noise-sensitive land uses surrounding the Hermantown Industrial site.

The noise modeling determined the one-hour equivalent sound level (L_{eq}) for sensitive receptors near the Hermantown Industrial site. The L_{eq} is an average of all the sound energy measured over one hour. The L_{eq} was compared to L_{50} thresholds for the receptors based on their noise area classification. Given the L_{50} thresholds are more restrictive than the L_{10} thresholds, if modeled sound levels were near or below L_{50} thresholds, they were also considered below L_{10} thresholds.

The location of sensitive receptors is not necessarily at the property line; for instance, if the parcel on which the receptor is located is large and residential outdoor activity is limited to a backyard patio, then noise would be analyzed at the closest exterior area of frequent human use.

The SoundPLAN-predicted equivalent typical operational noise levels for the Assumed Phase I scenario are anticipated to be less than 50 dB(A) at all residences surrounding the Hermantown Industrial site.

The SoundPLAN-predicted equivalent typical operational noise levels for the Full Buildout scenario are anticipated to range between approximately 46 dB(A) and 52 dB(A) at the closest residences north and east the site. Since the typical operational noise levels are anticipated to slightly exceed the nighttime noise limit of 50 dB(A) at the closest residential uses north and east of the site, noise abatement measures were analyzed.

The anticipated operational noise contours for the modeled scenarios without noise abatement are shown in the figures to follow.

Figure 4. Assumed Phase I Operational Noise Contours - Typical Operations

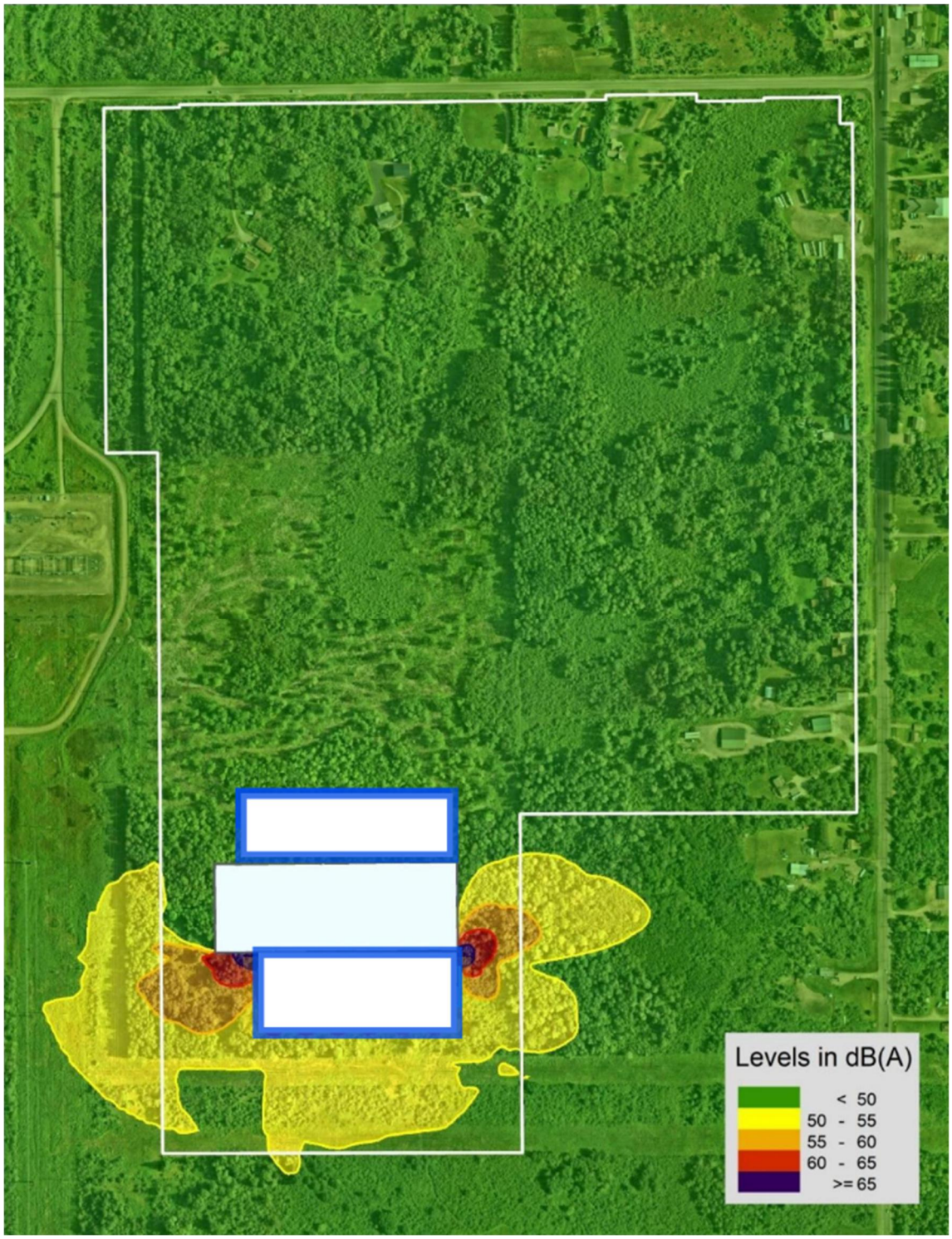
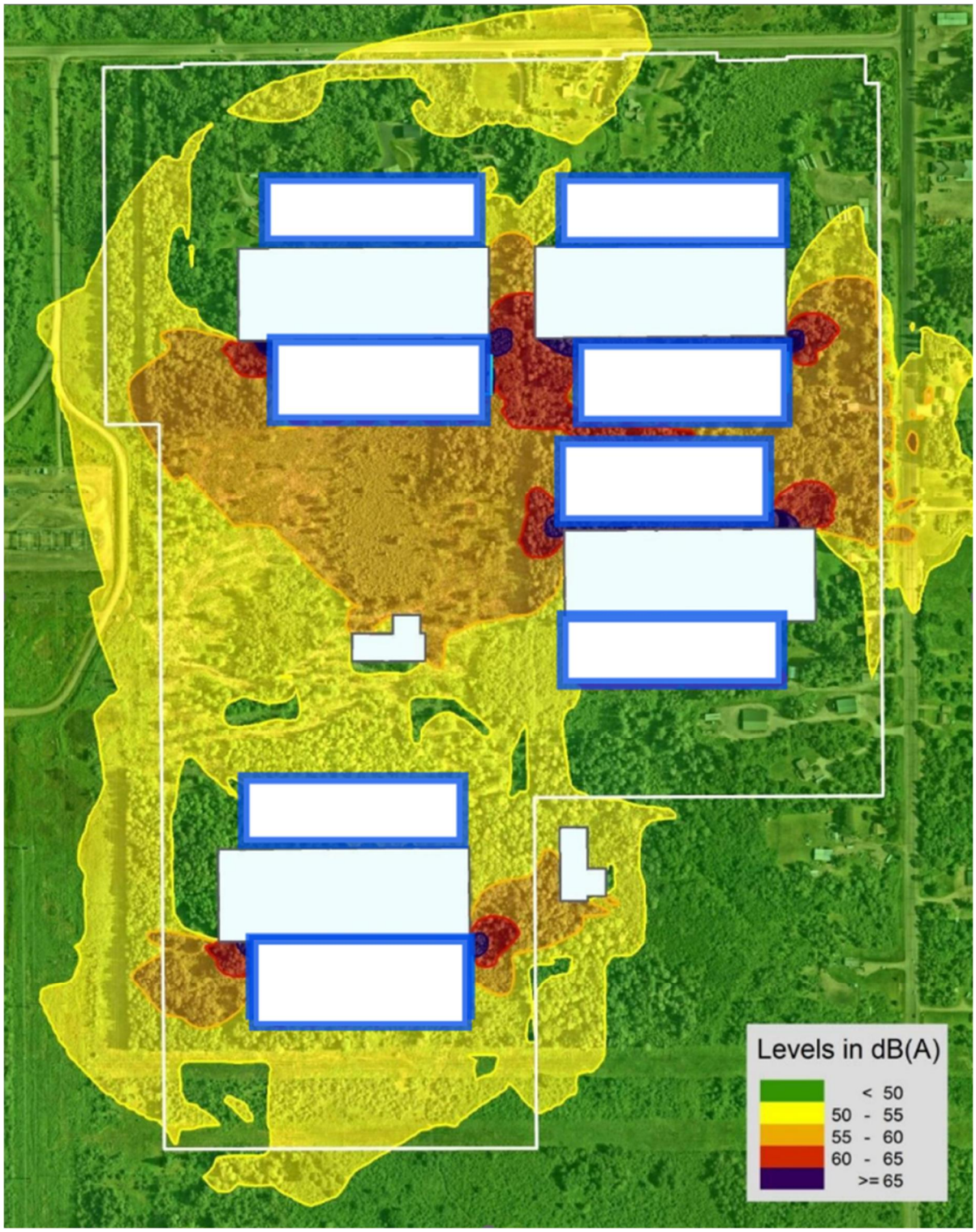


Figure 5. Full Buildout Operational Noise Contours - Typical Operations



Noise Abatement Measures

Passive noise abatement measures are effective because they absorb sound energy, extend the source-to-receptor sound transmission path, or both. Sound absorption is a function of abatement medium (e.g. earth berms absorb more sound energy than noise walls of the same height because earth berms are more massive). The source-to-receptor path is extended by placement of an obstacle, such as an earth berm or concrete wall, that sufficiently blocks the transmission of sound waves that travel from the source to the receptor.

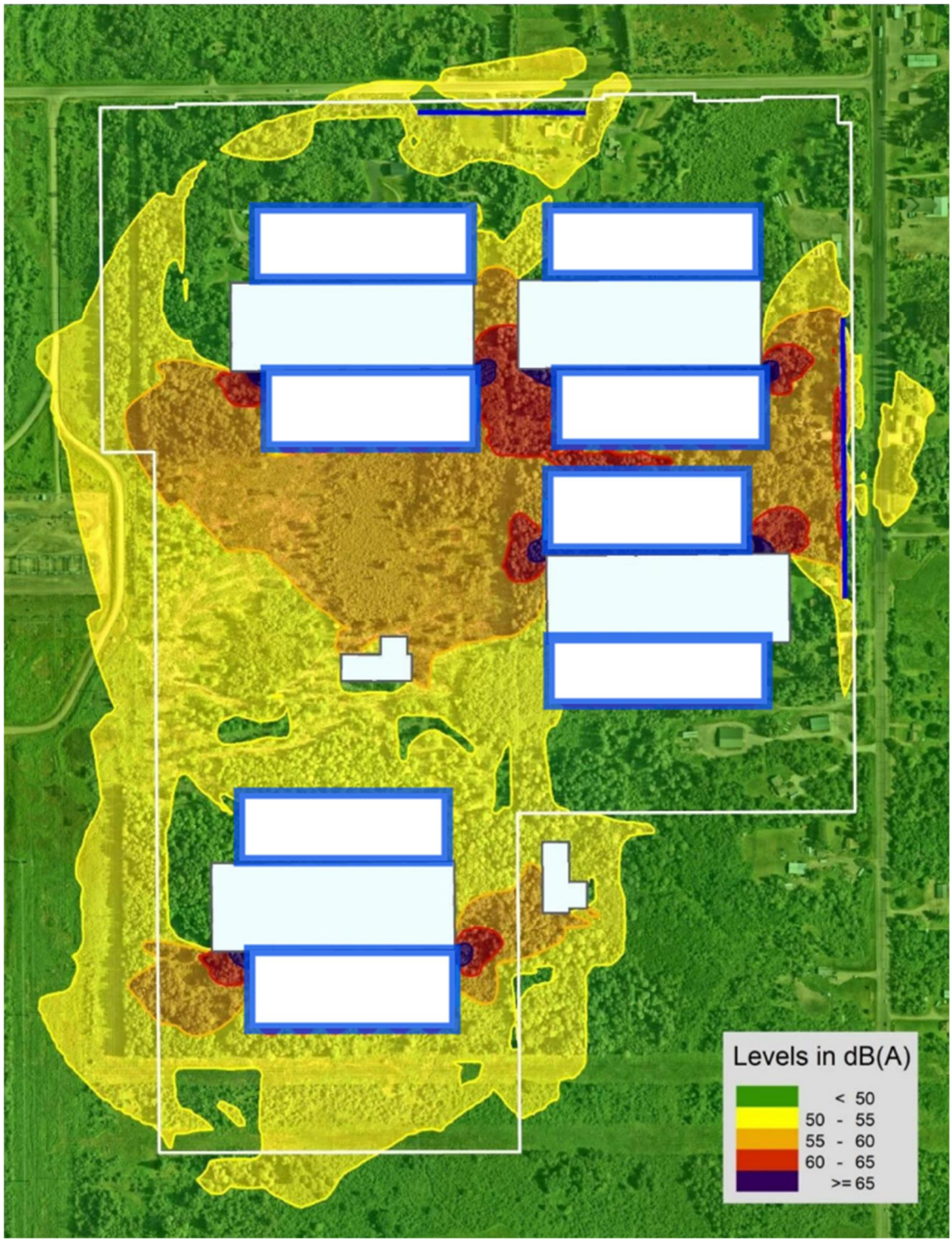
Sound barriers are primarily constructed as earth berms or solid-mass walls adjacent to sources of noise that are in proximity to noise-sensitive land use(s). To be effective, a sound barrier must be long enough and tall enough to shield potentially impacted areas.

Since predicted noise levels from typical operations are anticipated to slightly exceed the nighttime noise level limit at the nearest residences north and east of the project site, noise abatement measures were evaluated to reduce these levels to be approximately 50 dB(A) or lower.

The screen wall adjacent to the northern property boundary, as well as an earthen berm and screen wall along the eastern property boundary, were considered. The proposed screen wall to the north was modeled at a height of 16 feet, and the proposed screen wall on top of the earthen berm to the east was modeled at a height of 10 feet. The proposed screen walls are anticipated to reduce the typical operational noise levels at the closest noise-sensitive land uses to be near or below approximately 50 dB(A).

The anticipated noise contours for the typical operational scenario, including the modeled sound abatement measures, are illustrated in figure below.

Figure 6. Full Buildout Operational Noise Contours – Typical Operations with Abatement



Conclusions

After modeling and analyzing the proposed operational scenarios at the Hermantown Industrial site, Kimley- Horn determined that on-site operational noise levels are anticipated to slightly exceed the nighttime noise level limit of 50 dB(A) at the residences to the north and east at Full Buildout for typical operations.

Without mitigation, the predicted typical operational noise levels are expected to range between approximately 46 dB(A) and 52 dB(A). To reduce typical operational noise level, implementing a screen wall along the northern property boundary, approximately 16 feet in height, is recommended. Additionally, a screen wall, approximately 10 feet in height, on top of the earthen berm to the east is recommended. With these noise abatement measures in place, typical operational noise levels are anticipated to be reduced to be near or below approximately 50 dB(A) at the closest noise-sensitive land uses.