

**To:** Brett Morris, Project Manager – Palmer Coking Coal Company, LLP  
**From:** David Strohm, Jafar Al-khalaf – Trinity Consultants  
**Date:** September 3, 2021  
**RE:** Noise Analyses for Proposed Site in Enumclaw, WA – Version 1.0

Trinity Consultants (Trinity) was retained by Palmer Coking Coal Company, LLP (Palmer) to conduct a noise modeling assessment for the proposed site operations at its facility located in Enumclaw, WA (Facility). This memorandum summarizes the results of Trinity's acoustic assessment.

## 1.0 Noise Sources

Trinity conducted a detailed review of the potential noise generating equipment at the proposed Facility. **Table 1** summarizes the equipment and the corresponding sound power levels used to develop the acoustic model. Sound power levels were obtained from manufacturer specification sheets provided by Palmer.

**Table 1 – Noise Sources & Sound Power Levels**

Equipment	Sound Power Level
Jaw Crusher LT106	122.4 dBA
Cone Crusher LT220D	122 dBA
C9 Generator Engine Stack	100.6 dBA
C9 Generator Engine Mechanical Noise	114.2 dBA
C13 Generator Engine Stack	92.6 dBA
C13 Generator Engine Mechanical Noise	117.6 dBA
CAT 980-G Loader	107 dBA
Komatsu WA500 Loader	109 dBA
Truck Traffic	106.2 dBA

**Figure 1** shows the facility location, noise sensitive receptors and the King County parcel lots subject to this assessment. **Figure 2** shows the location of noise sources at the proposed Facility.

## 2.0 Applicable Sound Level Criteria

### *2.1 King County Ordinance, Title 12, Public Peace, Safety and Morals*

Section 12.86.110 of the King County Noise Ordinance provides sound level criteria for Rural, Residential, Commercial and Industrial land uses. These sound level limits are summarized in **Table 2**.

**Table 2 – King County Sound Level Criteria for Land Use Districts**

<b>Sound Source District</b>	<b>Receiving Property District</b>			
	<b>Rural</b>	<b>Residential</b>	<b>Commercial</b>	<b>Industrial</b>
Rural	49 dBA	52 dBA	55 dBA	57 dBA
Residential	52 dBA	55 dBA	57 dBA	60 dBA
Commercial	55 dBA	57 dBA	60 dBA	65 dBA
Industrial	57 dBA	60 dBA	65 dBA	70 dBA

The applicable sound criteria for this assessment are those associated with the Industrial sound source district as shown in **Table 2**.

### 3.0 Acoustic Modeling

#### *Methodology & Assumptions*

Trinity conducted a detailed review of the equipment at the proposed Facility and identified significant noise sources, their locations, and parameters. Sound power levels of significant noise sources were input into the Cadna-A (Computer Aided Noise Abatement, version 4.4) acoustic model. The model determines the impact of each noise source at each identified receptor. The computer model is based on equations detailed in ISO Standard 9613-2 "Acoustics – Attenuation of Sound During Propagation Outdoors". The ISO based model accounts for reduction in sound level due to increased distance and geometrical spreading, air absorption, ground attenuation, and acoustical shielding by intervening structures, topography, and vegetation. The model is considered conservative since it represents atmospheric conditions that promote propagation of sound from source to receiver.

The following assumptions were applied in the acoustic model:

- Sound power levels were obtained from manufacturer specification sheets provided by Palmer;
- Sound was assumed to propagate from the highest point from each piece of equipment;
- Surrounding ground surface were assumed to be absorptive (Ground Absorption Coefficient = 1);
- The foliage option was introduced where appropriate to account for year-round coniferous vegetation with heights ranging from 30 to 40 feet;
- Lateral Diffraction and second order reflection were included in the acoustic model; and
- All significant noise sources included in the acoustic model were assumed to operate continuously and simultaneously (full load operations) during the daytime periods.

#### *Results & Discussion*

**Table 3** summarizes the modeled sound level impacts at the noise sensitive receptors that may be potentially impacted by the Facility. These receptors were selected since they represent the closest residential developments to the Facility.

**Table 3 – Modeled Sound Level Impacts  $L_{eq}$  (dBA) – Noise Sensitive Receptors**

Location	Sound Level Impact $L_{eq}$ (dBA)	Applicable King County Noise Criteria (dBA)	Compliant with Criteria? (Yes/No)
R1	48.6	60	Yes
R2	48.7	60	Yes
R3	48.6	60	Yes

As shown in **Table 3**, The proposed Facility will be compliant with the King County noise criteria at the noise sensitive receptors. **Figure 3** provides the sound level impact contours and the sound level impact at the worst-case receptors at 4.5 m above ground to represent a second story window. **Table 4** provides the worst-case sound level impacts for each impacted King County parcel and the corresponding district classification.

**Table 4 – Modeled Sound Level Impacts  $L_{eq}$  (dBA) – King County Parcels**

King County Parcel Number	Maximum Sound Level Impact $L_{eq}$ (dBA)	District Classification	Applicable King County Noise Criteria (dBA)	Compliant with Criteria? (Yes/No/Potentially)
9027	63	Residential	60	Potentially <sup>a</sup>
9030	65	Residential	60	Potentially <sup>a</sup>
9076	60	Residential	60	Potentially <sup>a</sup>
9077	62	Residential	60	Potentially <sup>a</sup>
9078	59	Residential	60	Yes
9082	59	Residential	60	Yes
9081	60	Residential	60	Yes
9005	57	Residential	60	Yes
9006	54	Residential	60	Yes
9042	72	Industrial	70	Potentially <sup>b</sup>
9025	71	Industrial	70	Potentially <sup>b</sup>

- Parcels 9027, 9030, 9076 and 9077 are zoned for residential use and are owned by Palmer. It is not expected that those parcels will be developed into residential properties, therefore noise complaints and noise compliance issues are not expected at these locations.
- Parcels 9042 and 9025 contain similar mining/quarry operations. Complaints and noise compliance issues are not expected since the noise generated by their operations would exceed Palmer's.

## 4.0 Conclusions

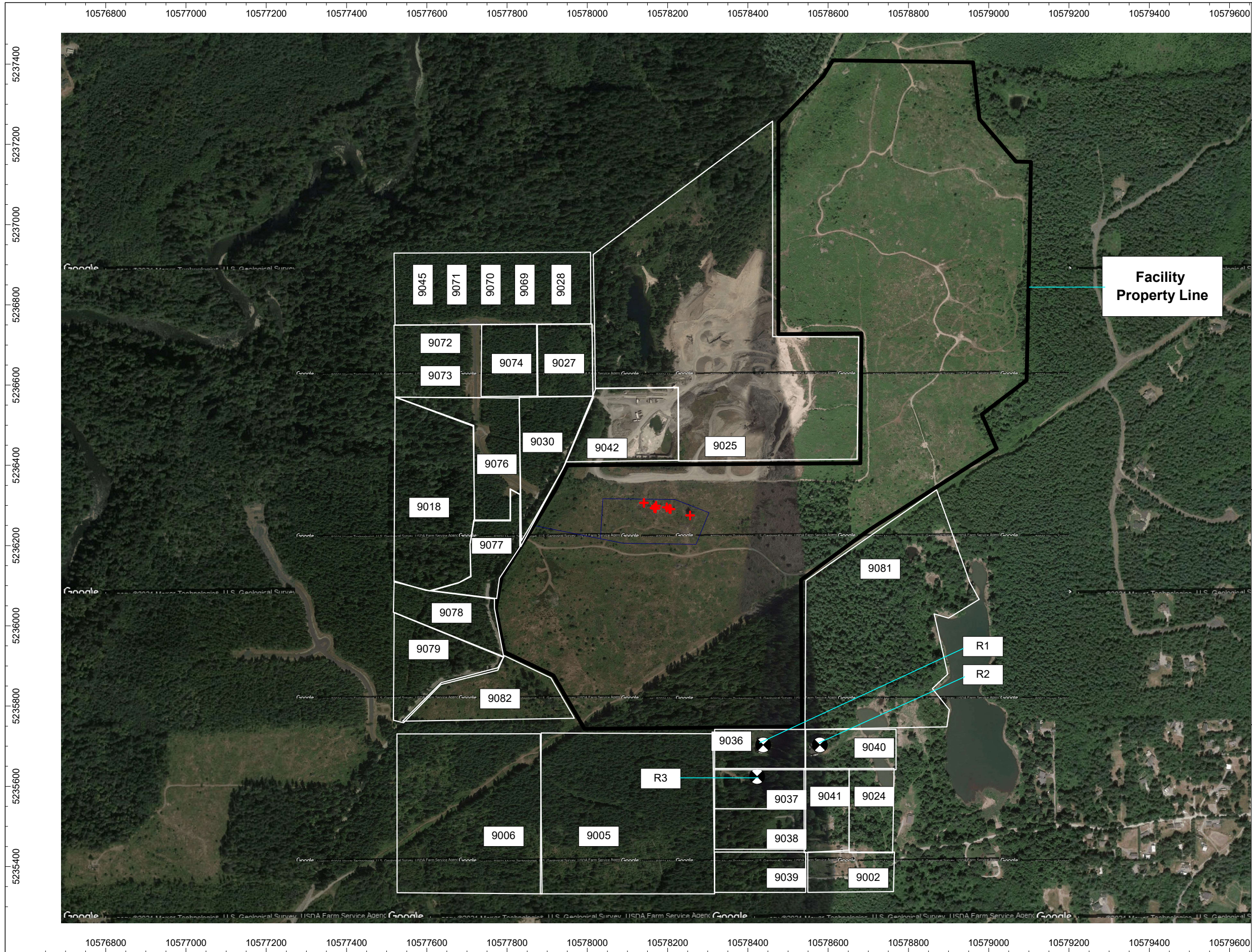
Trinity was retained by Palmer to conduct a noise modeling assessment for the proposed site operations at its proposed facility located in Enumclaw, WA. Trinity utilized the manufacturer specifications to quantify the equipment sound power levels.

Sound power levels were input into the Cadna-A acoustic model to predict sound level impacts and to generate sound level impact contours in the area. Sound level impacts were compared with the noise criteria provided in the King County Noise Ordinance. It was concluded that the sound level impacts produced by the proposed facility operations are compliant with the King County noise criteria. However, if the vacant lots currently owned by Palmer will be zoned for residential use in the future, the Facility has the potential to exceed the noise criteria.

## **APPENDIX A: FIGURES**

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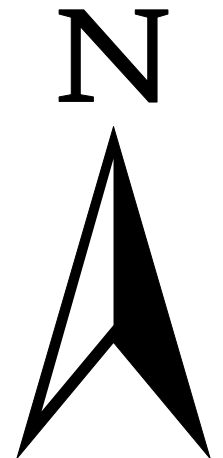





**Figure 1**

**Scaled Area Location Plan  
& Surrounding  
King County Parcels**

**Acoustic Assessment Report**

**Palmer Coking Coal Co., LLP  
King County, WA**



-  Point Source
-  Line Source
-  Receiver



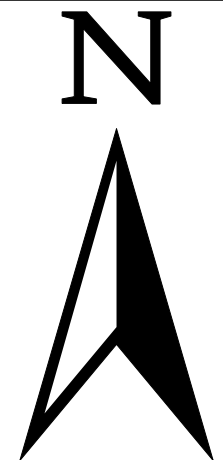


**Figure 2**

**Noise Source Location Plan**

**Acoustic Assessment Report**

**Palmer Coking Coal Co., LLP  
King County, WA**



- + Point Source
- Line Source
- ⊗ Receiver



**Figure 3**

**Sound Level Impact Contours  
@ 4.5 m above ground**

**Acoustic Assessment Report**

**Palmer Coking Coal Co., LLP  
King County, WA**

