

**Verizon Wireless • Proposed Base Station “Bernal Peak”
14000 Point Reyes Petaluma Road • Point Reyes Station, California**

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained on behalf of Verizon Wireless, a wireless telecommunications carrier, to evaluate its base station “Bernal Peak” proposed to be located at 14000 Point Reyes Petaluma Road near Point Reyes Station, California, for compliance with municipal limits on sound levels from the installation.

Executive Summary

Verizon proposes to install antennas and ground equipment on the agricultural property located at 14000 Point Reyes Petaluma Road in the Point Reyes Station area of unincorporated Marin County. Noise from the proposed operation will comply with the County’s permitted limits.

Prevailing Standard

The County of Marin sets forth limits on sound levels in its Countywide Plan, adopted November 6, 2007 (revised January 24, 2023). Figure 3-43 lists the following hourly average benchmark noise levels at the property lines of the receiving land use: 50 dBA for daytime (7 am to 10 pm) and 45 dBA at night. Nighttime standards apply only when the receiving land use operates or is occupied at night. The allowable noise level is tightened by 5 dB if the measured existing ambient hourly average is at least 10 dB lower than the pertinent noise limit above. Goal NO-1.a states that these standards shall apply for any new stationary noise-generating developments proposed near existing residential or other noise-sensitive land uses.

Figure 1 attached describes the calculation methodology used to determine applicable noise levels for evaluation against the prevailing standard.

General Facility Requirements

Wireless telecommunications facilities (“cell sites”) typically consist of two distinct parts: the electronic base transceiver units (“radio”) that are connected to traditional wired telephone lines, and the antennas that send wireless signals created by the radios out to be received by individual subscriber units. Radios are often located near the antennas and cabinets are often located outdoors at ground level. Cabinets typically require environmental units to cool the electronics inside. Such cooling is often integrated into the cabinets, although external air conditioning may be installed, especially when the cabinets are housed within a larger enclosure.



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Site & Facility Description

According to information provided by Verizon, including drawings by All States Engineering and Surveying, dated November 12, 2024, that carrier proposes to install a new base station on the hillside located at 14000 Point Reyes Petaluma Road in the Point Reyes Station area of unincorporated Marin County, consisting of directional panel antennas and associated radio units on a tower, configured to resemble an elevated water tank, to be constructed within a new concrete-block compound. Three equipment cabinets with integrated air-conditioning would be installed at ground within the compound, as well as a diesel back-up power generator.*

The nearest property line is about 1,500 feet to the southwest, based on the drawings.

Study Results

The antennas are passive, generating no noise, and the radios are convectively cooled, also generating no noise. The equipment cabinets are assumed to meet Telcordia Standard GR-487, limiting noise from outdoor electronics equipment cabinets to 65 dBA, measured at a reference distance of 5 feet. For the purpose of this study, the generator is assumed to be a Generac Model SD030, which has a maximum noise rating of 63 dBA, at a reference distance of 23 feet.

The maximum calculated noise level at the nearest property line for the everyday operation of the proposed Verizon base station is 17.3 dBA, well below the County’s most restrictive, nighttime noise limit of 45 dBA. On the day the generator is exercised, or during its continuous operation in the event of commercial power outage, the maximum calculated noise level at the nearest property line rises to 24.6 dBA, still well below the County’s most restrictive limit.

Conclusion

Based on the information and analysis above, it is the undersigned’s professional opinion that operation of the Verizon Wireless base station proposed to be located at 14000 Point Reyes Petaluma Road in Marin County, California, will comply with Marin County’s requirements for limiting acoustic noise emission levels.

* Back-up power generators are typically exercised for a 15-minute period once a week during daytime hours on a non-holiday weekday.

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Authorship

The undersigned author of this statement is a qualified Professional Engineer, holding California Registration Nos. E-13026 and M-20676, which expire on June 30, 2025. This work has been carried out under his direction, and all statements are true and correct of his own knowledge except, where noted, when data has been supplied by others, which data he believes to be correct.



A handwritten signature in blue ink that reads "William F. Hammett".

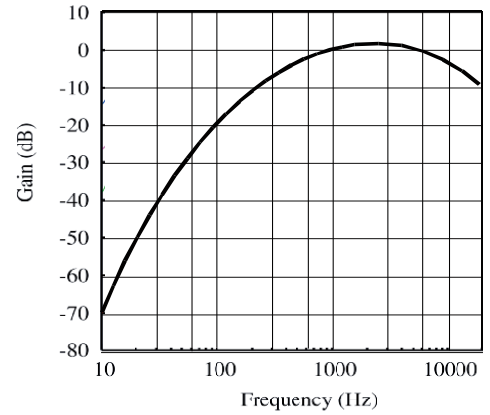
William F. Hammett, P.E.

707/996-5200

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Noise Level Calculation Methodology

Most municipalities and other agencies specify noise limits in units of dBA, which is intended to mimic the reduced receptivity of the human ear to Sound Pressure (“L_p”) at particularly low or high frequencies. This frequency-sensitive filter shape, shown in the graph to the right as defined in the International Electrotechnical Commission Standard No. 179, the American National Standards Institute Standard No. 5.1, and various other standards, is also incorporated into most calibrated field test equipment for measuring noise levels.



| | |
|--------|------------------|
| 30 dBA | library |
| 40 dBA | rural background |
| 50 dBA | office space |
| 60 dBA | conversation |
| 70 dBA | car radio |
| 80 dBA | traffic corner |
| 90 dBA | lawnmower |

The dBA units of measure are referenced to a pressure of 20 μPa (micropascals), which is the threshold of normal hearing. Although noise levels vary greatly by location and noise source, representative levels are shown in the box to the left.

Manufacturers of many types of equipment, such as air conditioners, generators, and telecommunications devices, often test their products in various configurations to determine the acoustical emissions at certain distances. This data, normally expressed in dBA at a known reference distance, can be used to determine the corresponding sound pressure level at any particular distance, such as at a nearby building or property line. The sound pressure drops as the square of the increase in distance, according to the formula:

$$L_p = L_K + 20 \log(D_K/D_p),$$

where L_p is the sound pressure level at distance D_p and L_K is the known sound pressure level at distance D_K.

Individual sound pressure levels at a particular point from several different noise sources cannot be combined directly in units of dBA. Rather, the units need to be converted to scalar sound intensity units in order to be added together, then converted back to decibel units, according to the formula:

where L_T is the total sound pressure level and L₁, L₂, etc are individual sound pressure levels.

$$L_T = 10 \log (10^{L_1/10} + 10^{L_2/10} + \dots),$$

Certain equipment installations may include the placement of barriers and/or absorptive materials to reduce transmission of noise beyond the site. Noise Reduction Coefficients (“NRC”) are published for many different materials, expressed as unitless power factors, with 0 being perfect reflection and 1 being perfect absorption. Unpainted concrete block, for instance, can have an NRC as high as 0.35. However, a barrier’s effectiveness depends on its specific configuration, as well as the materials used and their surface treatment.