

October 2011
FM Translator K299AN
Elko, Nevada Channel 299D
RF Exposure Study

Facilities Proposed

The proposed operation will be on Channel 299D (107.7 MHz) with a maximum lobe effective radiated power of 0.25 kilowatts. Operation is proposed with an antenna to be mounted on an existing tower on Elko Mountain. The antenna support structure does not exceed 60.96 meters (200 feet) above ground and does not require notification to the Federal Aviation Administration. Therefore, this structure does not require an Antenna Structure Registration Number.

A search of the FCC broadcasting databases indicates that the only broadcast facilities at this site are K299AN and FM station KNCC.

RF Exposure Calculations

While there are numerous other wireless licenses at the Elko Mountain transmitter site, insufficient data is available to provide any comprehensive and meaningful analysis of the contributions from each of those facilities. A high percentage of those facilities would operate only intermittently in any case, only when needed to transmit voice or data information. Therefore, the only facilities included in this analysis are K299AN and KNCC.

The power density calculations shown below were made using the techniques outlined in OET Bulletin No. 65. "Ground level" calculations in this report have been made at a reference height of 2 meters above ground to provide a worst-case estimate of exposure for persons standing on the ground in the vicinity of the tower. The equation shown below was used to calculate the ground level power density figures from each antenna.

$$S(mW / cm^2) = \frac{33.40981 \times AdjERP(Watts)}{D^2}$$

Where: *AdjERP(Watts)* is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

D is the distance in meters from the center of radiation to the calculation point.

Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

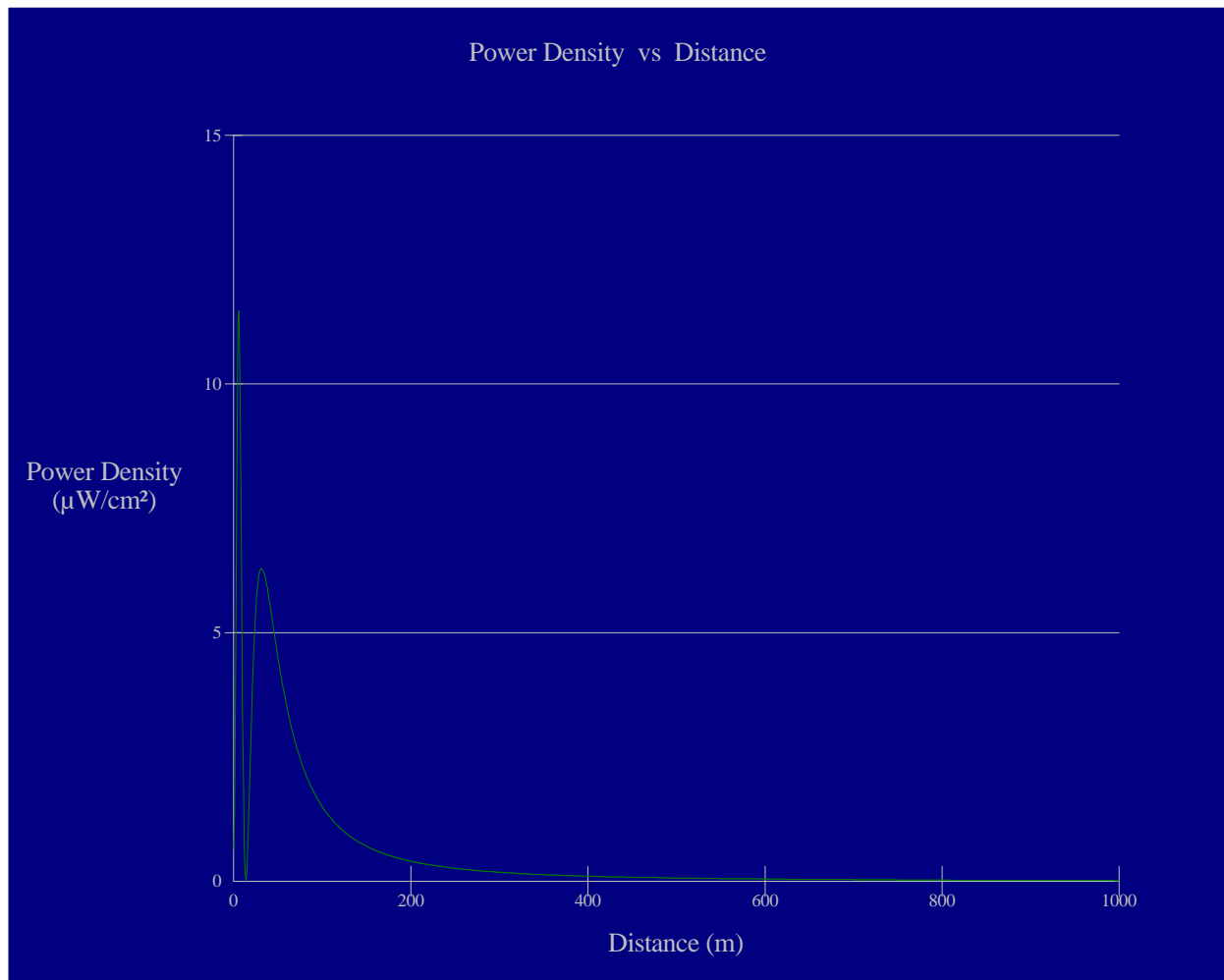
Calculations of the power density produced by the proposed antenna system assume a Type 6 element pattern, which is the appropriate element pattern for the Shively 6812B-2 antenna proposed for use. The highest calculated ground level power density occurs at a distance of 6 meters from the base of the antenna support structure. At this point the power density is calculated to be 11.5 μ W/cm².

Calculations of the power density produced by the nearby KNCC antenna system assume a Type 1 element pattern, which is the "worst case" element pattern for a ring-stub antenna. (The precise KNCC antenna model is not listed in the FCC database.) Under this worst-case assumption, the highest calculated ground level power density occurs at a distance of 2 meters from the base of

the antenna support structure. At this point the power density is calculated to be $82.0 \mu\text{W}/\text{cm}^2$.

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of K299AN and the present operation of KNCC (were their maxima to coincide, which they do not) is $93.5 \mu\text{W}/\text{cm}^2$, which is 9.4% of $1000 \mu\text{W}/\text{cm}^2$ (the FCC standard for controlled environments) and 46.8% of $200 \mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments).

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency exposure in excess of FCC guidelines.



Ground-Level RF Exposure

OET FMModel

K299AN Elko

Antenna Type: Shively 6812B-2

No. of Elements: 2

Element Spacing: 0.85 wavelength

Distance: 1000 meters

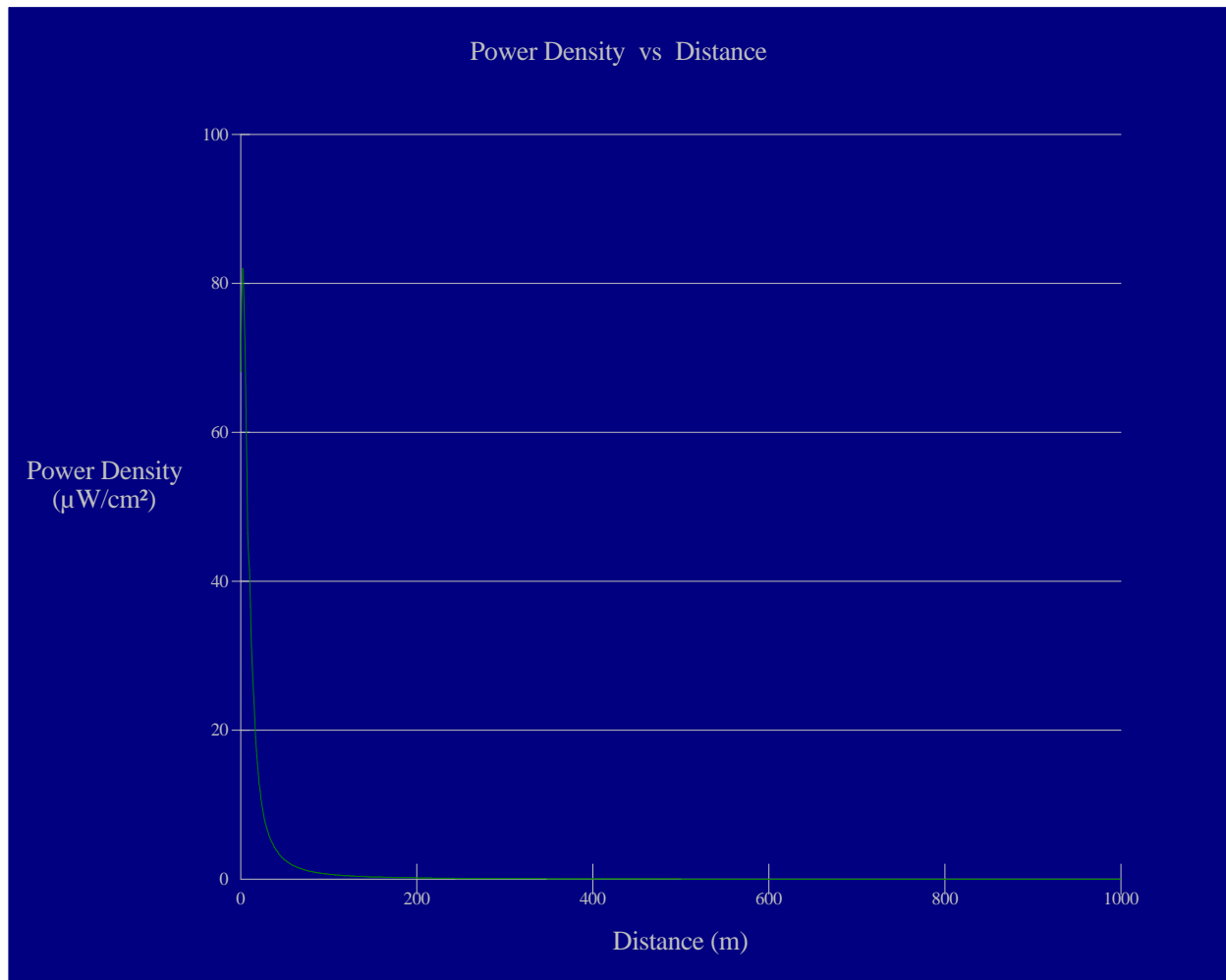
Horizontal ERP: 0.25 kW

Vertical ERP: 0.25 kW

Antenna Height: 12 meters AGL

Calculated Maximum Power Density is 11.5 : W/cm² at 6 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers



Ground-Level RF Exposure

OET FMModel

KNCC 218A Eiko

Antenna Type: worst-case ring-stub element model used for this study

No. of Elements: 1

Element Spacing: 1.0 wavelength

Distance: 1000 meters

Horizontal ERP: 0.1 kW

Vertical ERP: 0.1 kW

Antenna Height: 9 meters AGL

Calculated Maximum Power Density is $82.0 : \text{W}/\text{cm}^2$ at 2 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers