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**FM Auxiliary Antenna RFR Analysis**  
**KBOY-FM Channel 239C1 Medford, OR**

The proposed KBOY-FM auxiliary facility will operate on Channel 239C1 with an effective radiated power of 2.3 kilowatts. Operation is proposed with a 2-element circularly-polarized omnidirectional antenna mounted on a tower located atop Nugget Butte.

The only other broadcast user of this site is KRWQ(FM) 262C1 Gold Hill. (The KBOY-FM main facility operates from this site, but will not operate when the auxiliary is operating.) Precise calculations are made only with regard to the levels from the KBOY-FM auxiliary and KRWQ. Calculations have been made using station technical data from the FCC's Consolidated Database System and from the station licensee.

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.

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

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 KBOY-FM auxiliary antenna system assume a Type 2 element pattern, which is the element pattern for the Jampro antenna to be used by that facility. The highest calculated ground level power density occurs at a distance of 12 meters from the base of the antenna support structure. At this point the power density is calculated to be 65.4  $\mu\text{W}/\text{cm}^2$ , which is 6.5% of 1000  $\mu\text{W}/\text{cm}^2$  (the FCC standard for controlled environments such as this one).

Calculations of the power density produced by the KRWQ antenna system assume a Type 1 element pattern, which is the element pattern for the McMartin ring-stub antenna used by that station. The highest calculated ground level power density occurs at a distance of 9 meters from the base of the antenna support structure. At this point the power density is calculated to be 525.6  $\mu\text{W}/\text{cm}^2$ , which is 52.6% of 1000  $\mu\text{W}/\text{cm}^2$  (the FCC standard for controlled environments such as this one).

These calculations show that the maximum calculated power density produced at two meters above ground

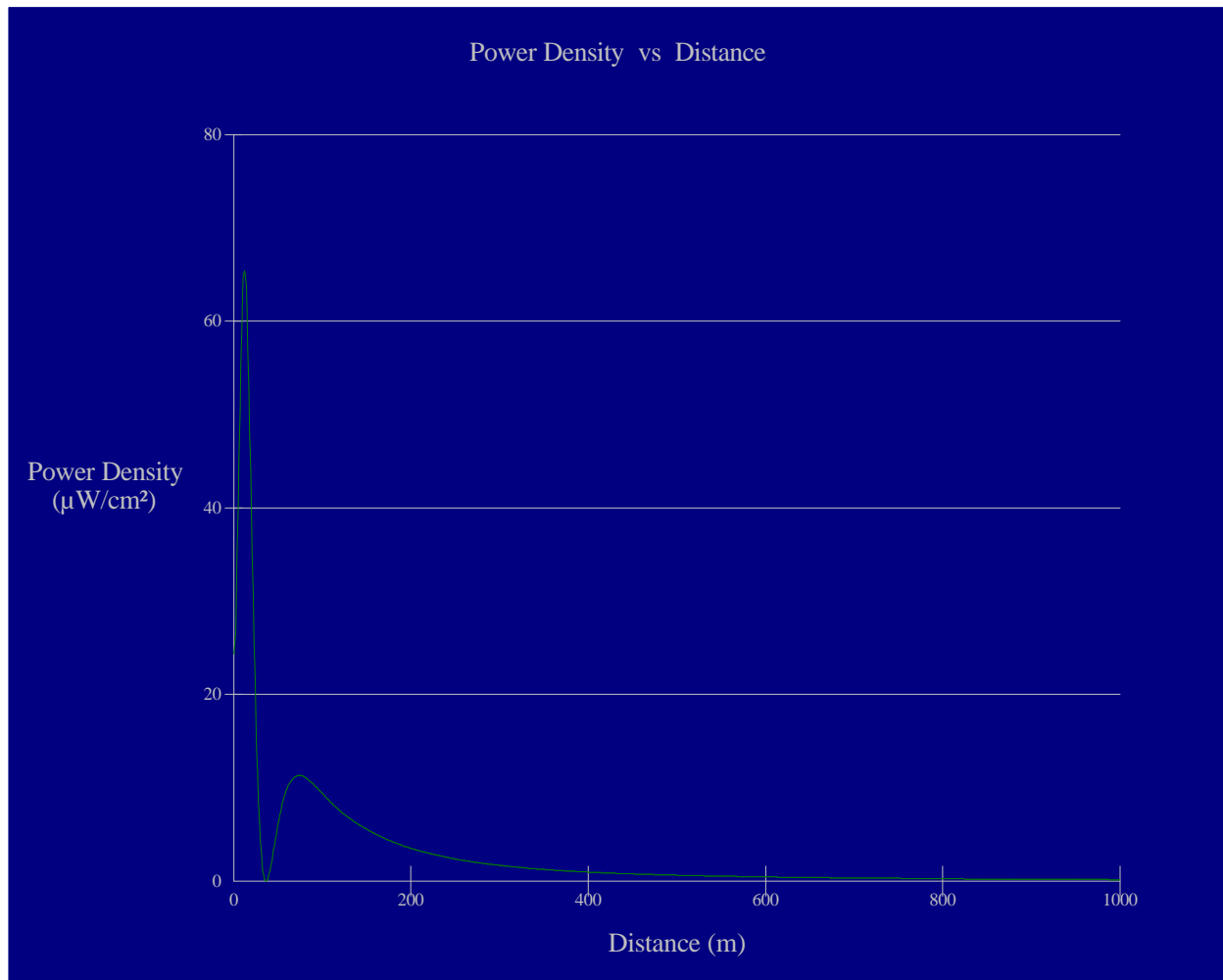
level by the operations of the KBOY-FM auxiliary and KRWQ (were their maxima to coincide, which they do not) is  $591 \mu\text{W}/\text{cm}^2$ , which is 59.1% of  $1000 \mu\text{W}/\text{cm}^2$  (the FCC standard for controlled environments such as this one).

This is a controlled-access site. According to information provided by the local chief engineer, there is a locked gate 1.9 miles down the lone access road to the Nugget Butte transmitter site. The unimproved access road is steep, rising 1378 feet over those 1.9 miles, representing an average grade of 14%.

Pursuant to OET Bulletin No. 65, all station personnel and contractors are required to follow appropriate safety procedures before any work is commenced on the antenna tower, including reduction in power or discontinuance of operation before any maintenance work is undertaken.

A handwritten signature in black ink, appearing to read 'Erik C. Swanson', with a stylized, flowing script.

Erik C. Swanson  
Technical Consultant



### Ground-Level NIER

### OET FMModel

KBOY-FM Auxiliary

Antenna Type: Jampro "double V"

No. of Elements: 2

Element Spacing: 1.0 wavelength

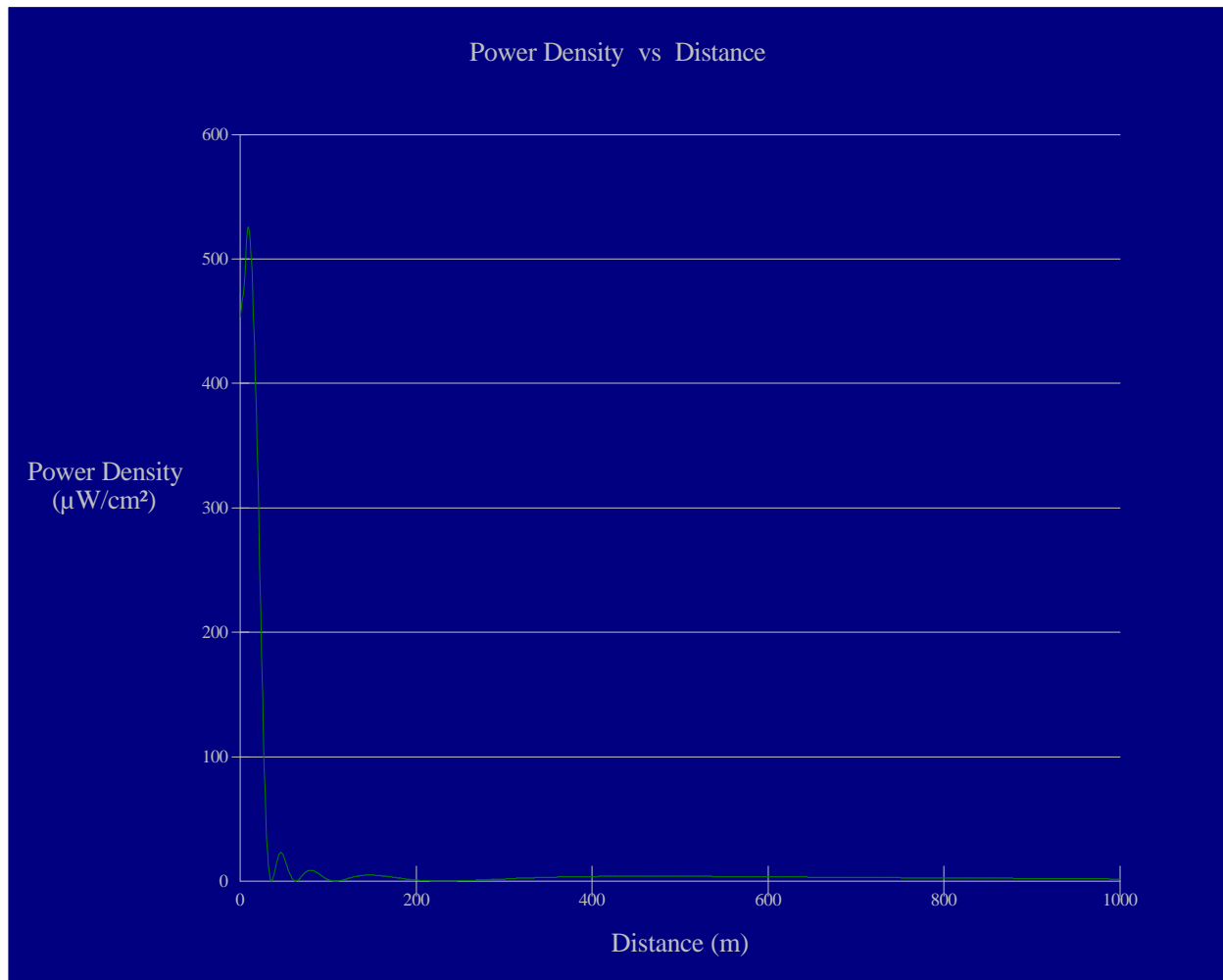
Distance: 1000 meters

Horizontal ERP: 2.3 kW

Vertical ERP: 2.3 kW

Antenna Height: 23 meters AGL

Maximum Power Density is 65.4 : W/cm<sup>2</sup> at 12 meters from the antenna structure.



### Ground-Level NIER

### OET FMModel

KRWQ(FM) 262C1 Gold Hill

Antenna Type: McMartin "ring stub"

No. of Elements: 5

Element Spacing: 1.0 wavelength

Distance: 1000 meters

Horizontal ERP: 30 kW

Vertical ERP: 30 kW

Antenna Height: 49 meters AGL

Maximum Power Density is 525.6 : W/cm<sup>2</sup> at 9 meters from the antenna structure.