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### July 2005 FM Station RFR Analysis KKHB(FM) Channel 288C1 Eureka, CA

KKHB operates on Channel 288C1 with an effective radiated power of 28 kilowatts. Operation is with a 6-element circularly-polarized omni-directional antenna mounted on a tower located at 8998 Kneeland Road.

In addition to KKHB, study of the area within 1000 meters of the proposed site reveals the following likely sources of non-ionizing radiation: KMUE(FM) 202C2 Eureka, and KIEM-TV Ch. 3 Eureka. In addition, KIEM-DT is authorized for operation at this transmitter site as BPCDT-19991027ABI. Calculations have been made using station technical data from the FCC's Consolidated Database System and/or 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 KKHB antenna system assume a Type 2 element pattern, which is the element pattern for the Jampro JHPC-6R antenna used by that station. The highest calculated ground level power density occurs at a distance of 14 meters from the base of the antenna support structure. At this point the power density is calculated to be 94.1  $\mu\text{W}/\text{cm}^2$ , which is 9.4% of 1000  $\mu\text{W}/\text{cm}^2$  (the FCC standard for controlled environments) and 47.1% of 200  $\mu\text{W}/\text{cm}^2$  (the FCC standard for uncontrolled environments).

Calculations of the power density produced by the KMUE antenna system assume a Type 2 element pattern, which is the element pattern for the Jampro JLLP-4RFR antenna used by that station. The highest calculated ground level power density occurs at a distance of 90 meters from the base of the antenna support structure. At this point the power density is calculated to be 3.9  $\mu\text{W}/\text{cm}^2$ , which is 0.4% of 1000  $\mu\text{W}/\text{cm}^2$  (the FCC standard for controlled environments) and 2.0% of 200  $\mu\text{W}/\text{cm}^2$  (the FCC standard for uncontrolled environments).

Power density levels produced by the KIEM-TV Channel 3 facility (100 kW peak ERP) were calculated for an elevation of 2 meters above ground (67 meters below the antenna radiation center). Calculations have been made assuming a maximum relative field value of 0.3 at depression angles below 45 degrees (typical for a 3-level batwing antenna such as the one used by KIEM-TV), and the shortest distance between the antenna radiation center and 2 meters above ground level (i.e. straight down). The resulting maximum calculated power density from the antenna occurs at the base of the antenna support structure. At this point the power density is calculated to be  $33.5 \mu\text{W}/\text{cm}^2$ , which is 16.8% of  $200 \mu\text{W}/\text{cm}^2$  (the FCC maximum at the Channel 3 visual carrier frequency for uncontrolled environments).

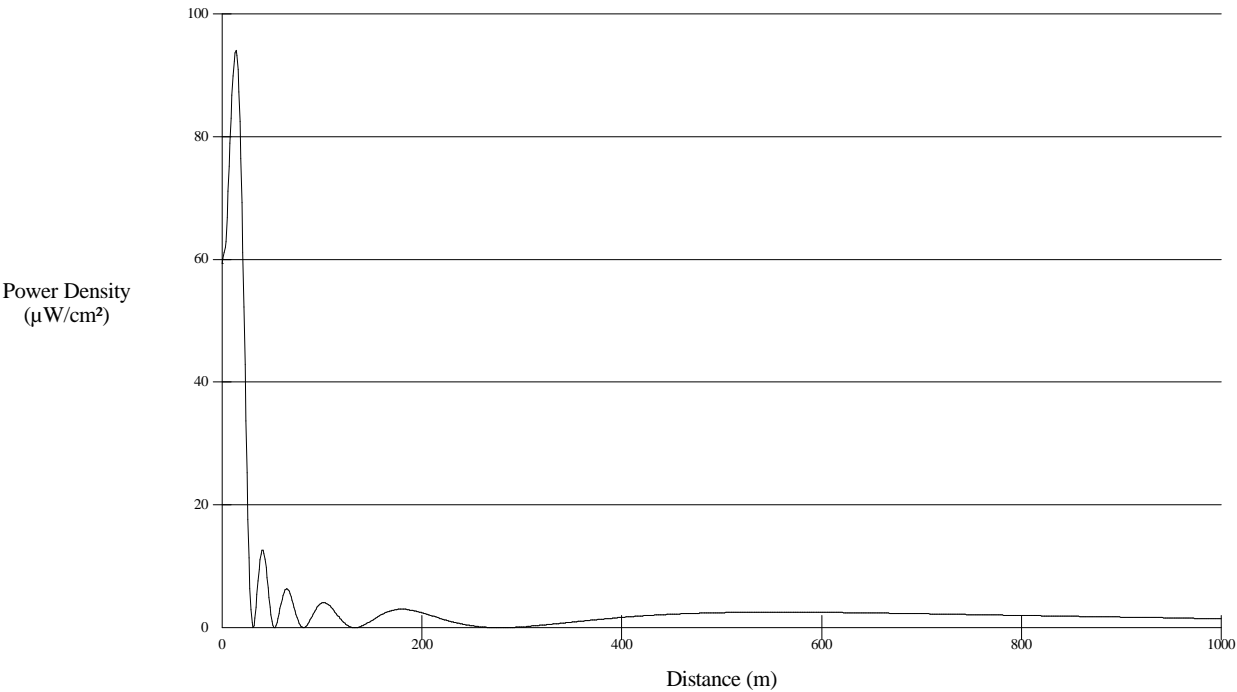
KIEM-DT is not known to be operational at this site, and indeed is authorized for STA operation at a separate transmitter site. Nevertheless, worst-case calculations of the maximum power density produced by the KIEM-DT Channel 16 antenna system (353 kW ERP) have been calculated for an elevation of 2 meters above ground (48 meters below the antenna radiation center). Calculations have been made assuming a maximum relative field value of 0.1 at depression angles below 45 degrees (based on review of the vertical plane pattern for the authorized Dielectric TFU-30DSCP230 antenna), and the shortest distance to two meters above ground level, i.e. straight down. The resulting maximum calculated power density from the antenna occurs at the base of the antenna support structure. At this point the power density is calculated to be  $51.2 \mu\text{W}/\text{cm}^2$ , which is 15.9% of  $323 \mu\text{W}/\text{cm}^2$  (the FCC maximum at the Channel 16 frequency for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the combined operations of KKHB, KMUE, KIEM-TV, and KIEM-DT (were their maxima to coincide, which they do not) is 81.8% of the FCC standard for uncontrolled environments.

A handwritten signature in black ink, appearing to read 'Erik C. Swanson'.

Erik C. Swanson  
Technical Consultant

Power Density vs Distance



Power Density vs Distance

