

NIER Calculations KKDV-FM Walnut Creek, CA

The power density calculations shown below were made using the techniques outlined in the EPA report titled: *An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM, and TV Broadcast Services* (Gailey & Tell, April, 1985). All calculations contained herein are based on the measured element patterns for the antenna, and follow the procedure shown in the Gailey and Tell report. The patterns were identified by applying the procedure outlined in the report to the measurement data contained in the report titled: *Element Pattern Measurements on FM Antennas* (EPA-520/ 6-85-107, June 1985).

"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. Equation #1, contained in the Gailey & Tell report and shown below, was used to calculate the ground level power density figures from each FM antenna at incremental distances from the base of its supporting tower.

$$S(\mu\text{W}/\text{cm}^2) = \frac{(\text{Adjusted ERP in Watts}) \times 1.64 \times 2.56 \times 100}{4 \times \pi \times (\text{Distance})^2}$$

Where: Adjusted ERP in Watts is the maximum lobe effective radiated power times the element pattern factor times the array pattern factor.

Distance = Distance in meters from the center of radiation to the calculation point.

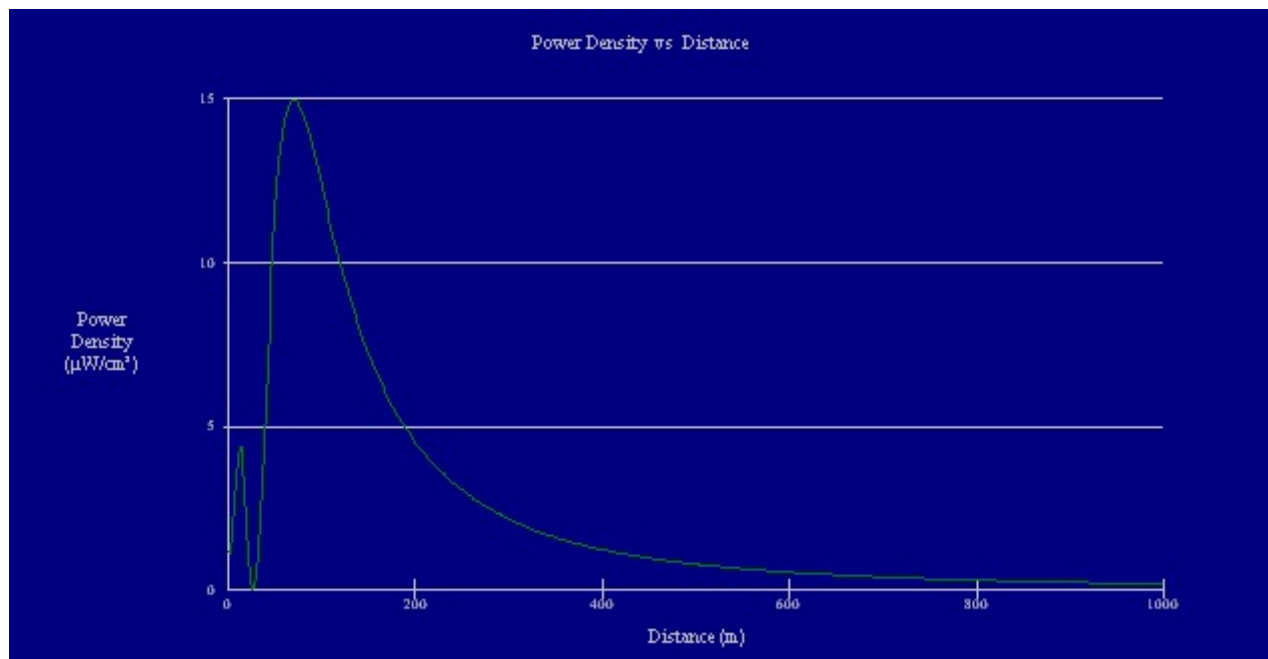
Ground level power densities have been calculated for locations extending from the base of the tower to a distance of 1000 meters. Values past this point are increasingly negligible.

The highest calculated ground level power density from the proposed antenna occurs at a distance of 70 meters from the base of the antenna support structure. At this point the power density is calculated to be 15 $\mu\text{W}/\text{cm}^2$, 7.5% of 200 $\mu\text{W}/\text{cm}^2$ (the FCC standard for uncontrolled environments). A search of the Commission's FM and TV databases shows that there are no other broadcast facilities within ½ km of the KKDV-FM transmitter site. There are several cellular and PCS base stations located on the same hilltop as KKDV, however these are all

located at least 100 feet from the KKDV tower, and employ directional antennas directed away from KKDV. The licensee has replaced the stations licensed 3 bay, 1λ spaced antenna with a 3 bay $1/2\lambda$ spaced antenna at the same height, and the ERP remains unchanged. We therefore believe the site to be in full compliance with the Commission's guidelines regarding human exposure to radio frequency radiation.

Public access to the site is restricted by a locked gate and the antenna tower is posted with warning signs. 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.

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 radiation in excess of FCC guidelines.



Ground-Level NIER

OET FMModel

KKDV-FM Walnut Creek, CA
Antenna Type: ERI LPX-3E-HW
No. of Elements: 3
Element Spacing: .5 wavelength

Distance: 1000 meters
Horizontal ERP: 3 kW
Vertical ERP: 3 kW

Antenna Height: 26 meters AGL

Maximum Power Density is $15 \mu\text{W}/\text{cm}^2$ at 70 meters from the antenna structure.

Statement of Engineer

This Engineering Report, relative to the replacement of the licensed antenna for KKDV-FM has been prepared by the undersigned. All representations contained herein are true to the best of my knowledge. I am an experienced radio engineer whose qualifications are a matter of record with the Federal Communications Commission. I am an engineer in the firm of Hatfield and Dawson Consulting Engineers and am Registered as a Professional Engineer in the States of Washington and Oregon.

Signed this 24th day of March, 2009



Thomas S. Gorton P.E.