

March 2015
KKDV(FM) Channel 221A
Walnut Creek, California
Auxiliary Antenna Engineering

Facilities Proposed

The proposed auxiliary antenna operation will be on Channel 221A (92.1 MHz) with an effective radiated power of 3 kilowatts. Operation is proposed with a 3-element circularly-polarized omni-directional half-wave-spaced antenna, mounted below the main KKDVB antenna on a tower on a hilltop in the city of Lafayette. KKDVB is the only broadcast user of this site.

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.

RF Exposure Calculations

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.

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

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

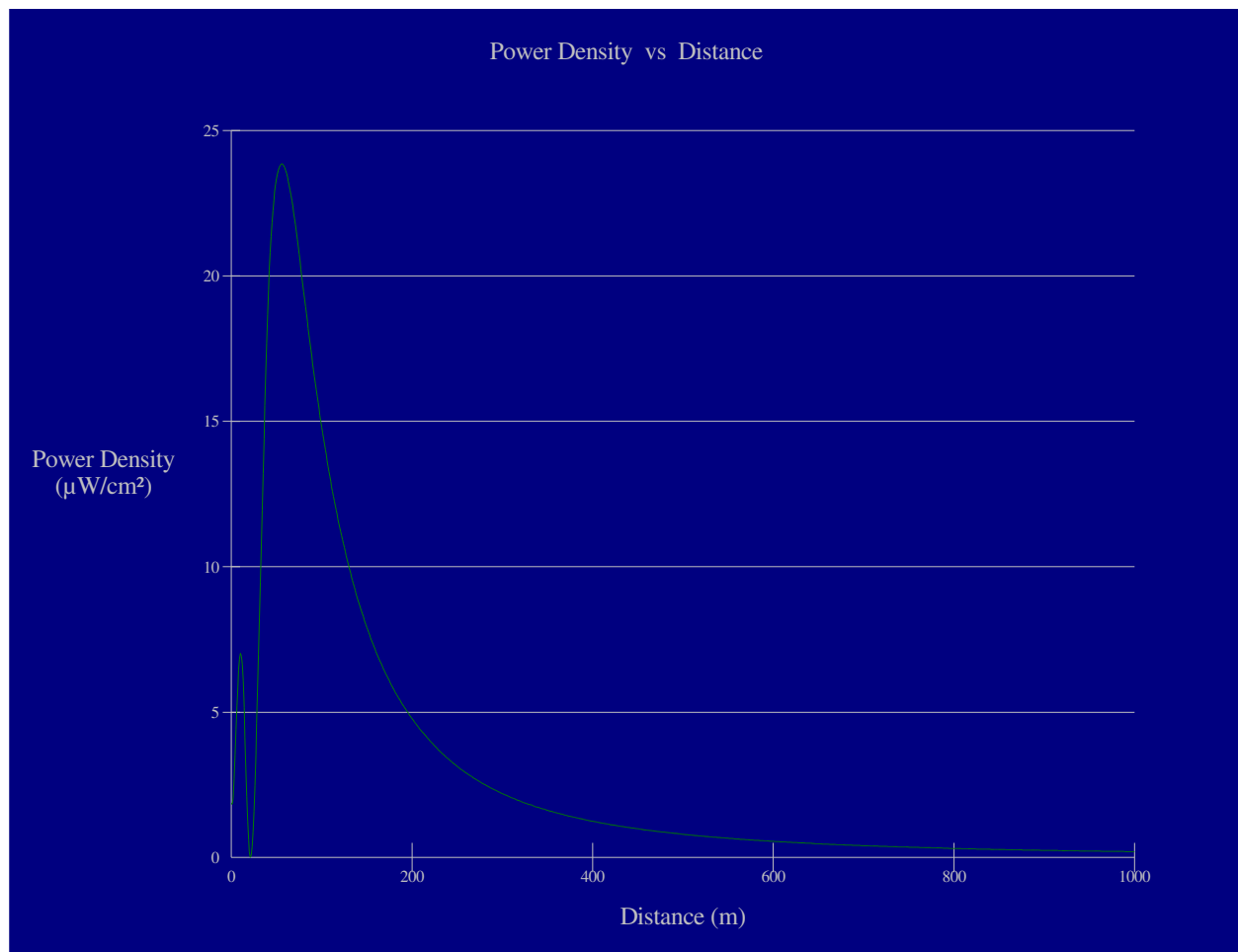
D is the distance in meters from the center of radiation to the calculation point.

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 3 element pattern, which is the element pattern for the ERI LPX-3E-HW antenna proposed for use. The highest calculated ground level power density occurs at a distance of 56 meters from the base

of the antenna support structure. At this point the power density is calculated to be $23.9 \mu\text{W}/\text{cm}^2$, which is 2.4% of $1000 \mu\text{W}/\text{cm}^2$ (the FCC standard for controlled environments) and 12.0% 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

KKDV 221A Auxiliary Antenna

Antenna Type: ERI LPX-3E-HW "rototiller"

No. of Elements: 3

Element Spacing: 0.5 wavelength

Distance: 1000 meters

Horizontal ERP: 3 kW

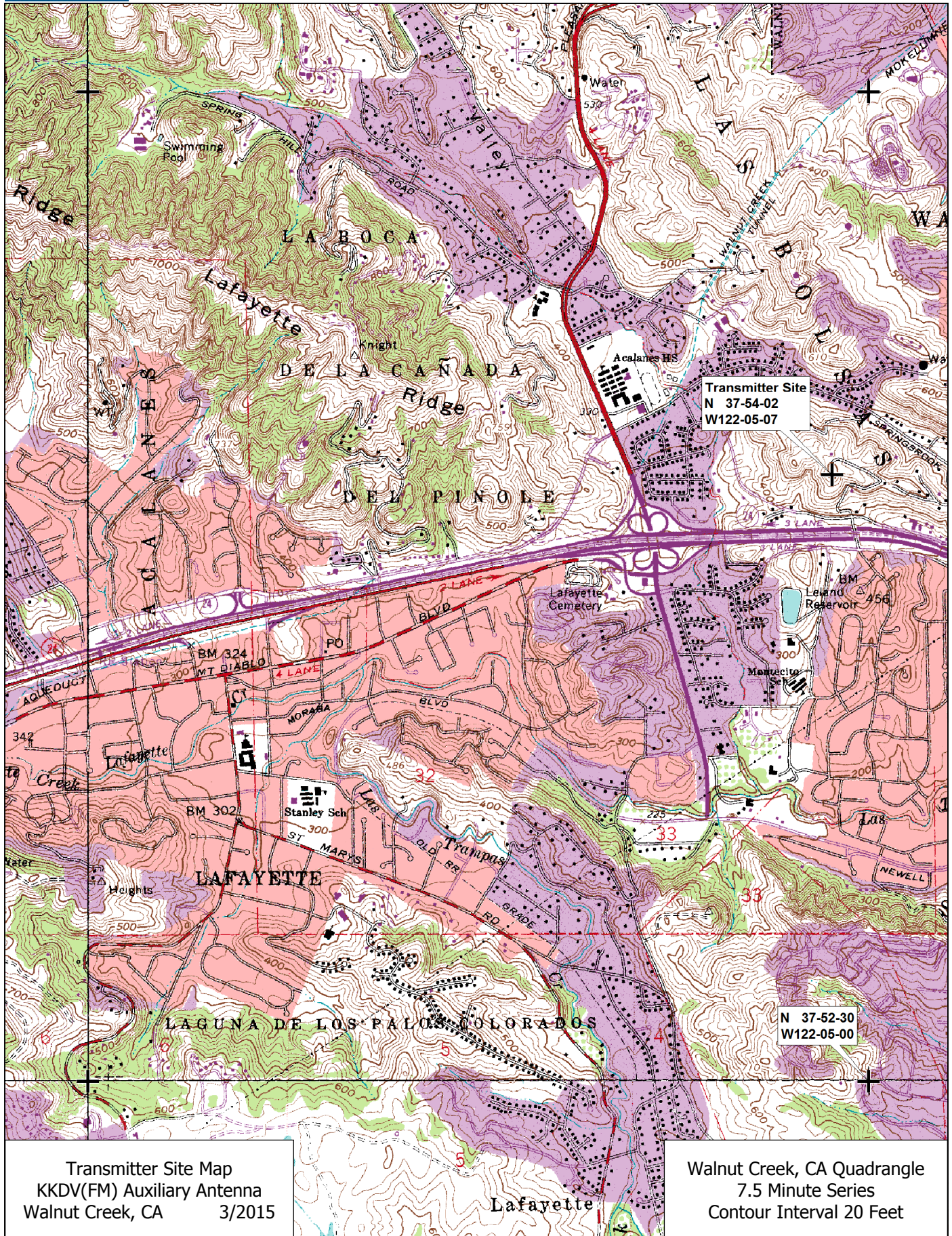
Vertical ERP: 3 kW

Antenna Height: 21 meters AGL

Maximum Calculated Power Density is 23.9 $\mu\text{W}/\text{cm}^2$ at 56 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers





Transmitter Site Map
KKDV(FM) Auxiliary Antenna
Walnut Creek, CA 3/2015

Walnut Creek, CA Quadrangle
7.5 Minute Series
Contour Interval 20 Feet

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