

January 2015
KZTA(FM) Channel 245C2
Naches, WA
Auxiliary Antenna Engineering

Facilities Proposed

The proposed auxiliary antenna operation will be on Channel 245 (96.9 MHz) with a maximum lobe effective radiated power of 0.875 kilowatts. Operation is proposed with a 1-element vertically-polarized dipole antenna. The antenna will be side-mounted on an existing tower located in the Rattlesnake Hills, having FCC Antenna Structure Registration Number 1232764.

Diplexed operation is proposed with FM translator K229AD.

Statement re Directional Antenna Pattern: While the proposed auxiliary antenna facility will operate with a directional antenna, it is not believed necessary to include a condition on the construction permit requiring proof-of-performance antenna pattern measurements on the Shively 6020-1 antenna. As is depicted on the attached contour map, the ERP of the proposed facility has been designed so that even if the auxiliary antenna were to operate omnidirectionally, the auxiliary 60 dBu contour would not exceed the main 60 dBu contour at any azimuth. (The omnidirectional ERP would need to exceed 1.4 kW for the auxiliary 60 dBu contour to extend beyond the main 60 dBu contour.)¹

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.

¹ In similar circumstances and with the same type of showing, the directional antenna proof-of-performance condition was not placed on the construction permits for auxiliary facilities for KXTA (Facility ID No. 28218, see BXPB-20130926AZJ) and KQBL (Facility ID No. 72658, see BXPB-20130926AZE).

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

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

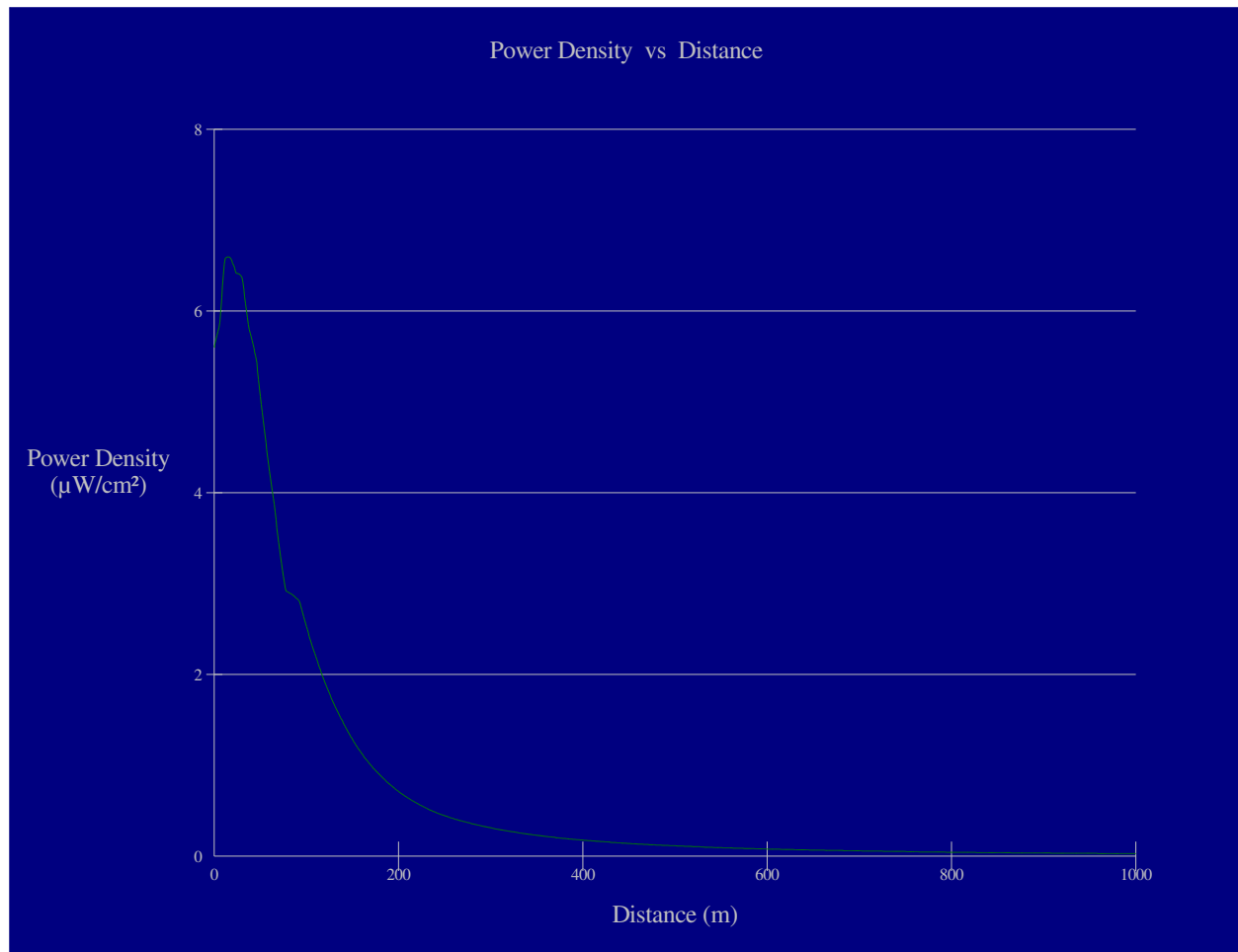
D is the distance in meters from the center of radiation to the calculation point.

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 1 element pattern, which is the element pattern for a dipole antenna. The highest calculated ground level power density occurs at a distance of 15 meters from the base of the antenna support structure. At this point the power density is calculated to be 6.6 $\mu W/cm^2$, which is 0.7% of 1000 $\mu W/cm^2$ (the FCC standard for controlled environments) and 3.3% of 200 $\mu W/cm^2$ (the FCC standard for uncontrolled environments).

These calculations show that the maximum calculated power density produced at two meters above ground level by the proposed operation of the KZTA auxiliary alone is less than 5% of the applicable FCC exposure limit at all locations between 1 and 1000 meters from the base of the antenna support structure. Section 1.1307(b)(3) of the Commission's Rules excludes applications for new facilities or modifications to existing facilities from the requirement of preparing an environmental assessment when the calculated emissions from the applicant's proposed facility are predicted to be less than 5% of the applicable FCC exposure limit. Therefore, the proposed facility is in compliance with Section 1.1301 *et seq* and no further analysis of RF exposure at this site is required in this application.

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

KZTA(FM) 245C2 Auxiliary Antenna

Antenna Type: Shively 6020-1 (dipole)

No. of Elements: 1

Element Spacing: 1.0 wavelength

Distance: 1000 meters

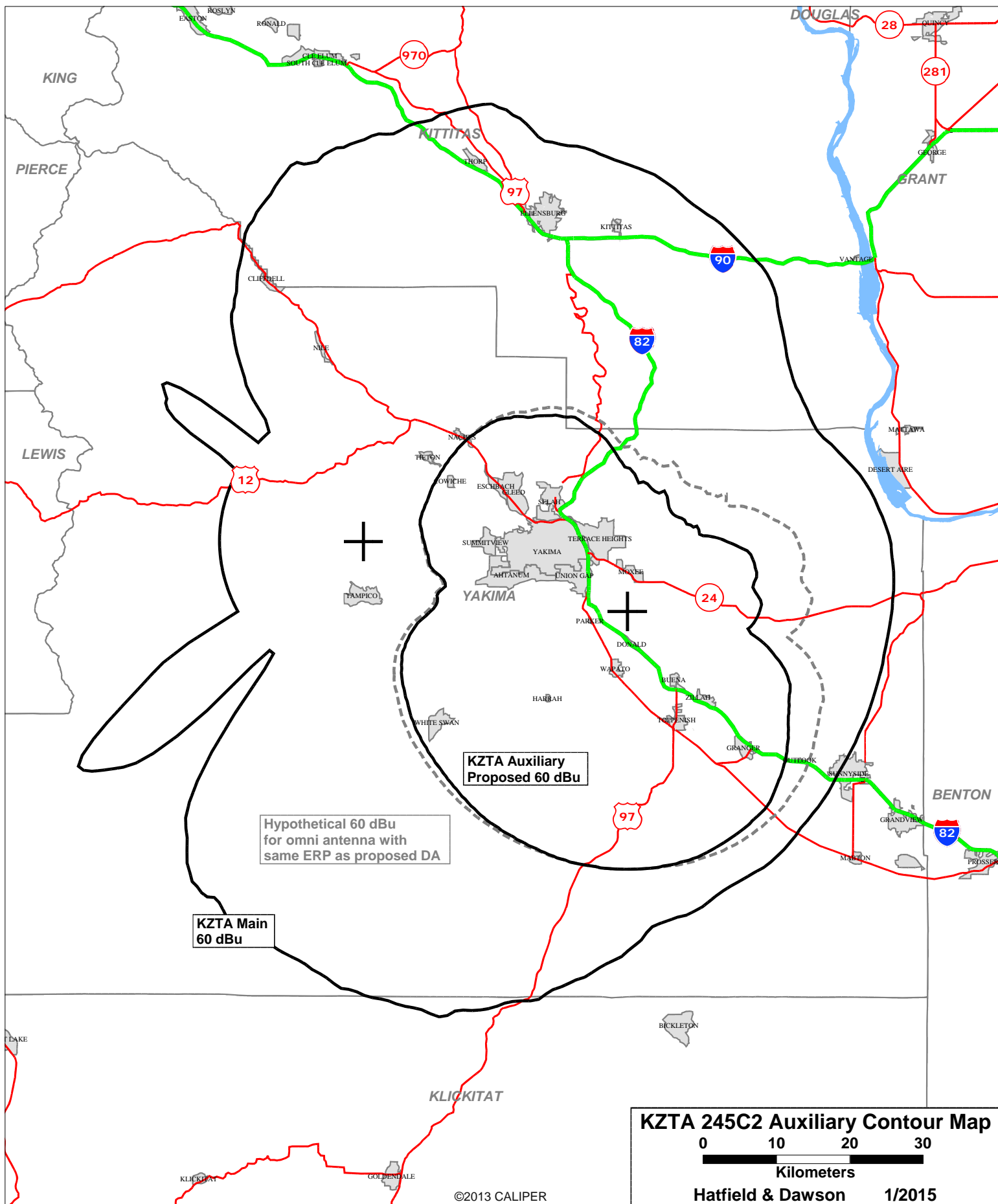
Horizontal ERP: zero kW

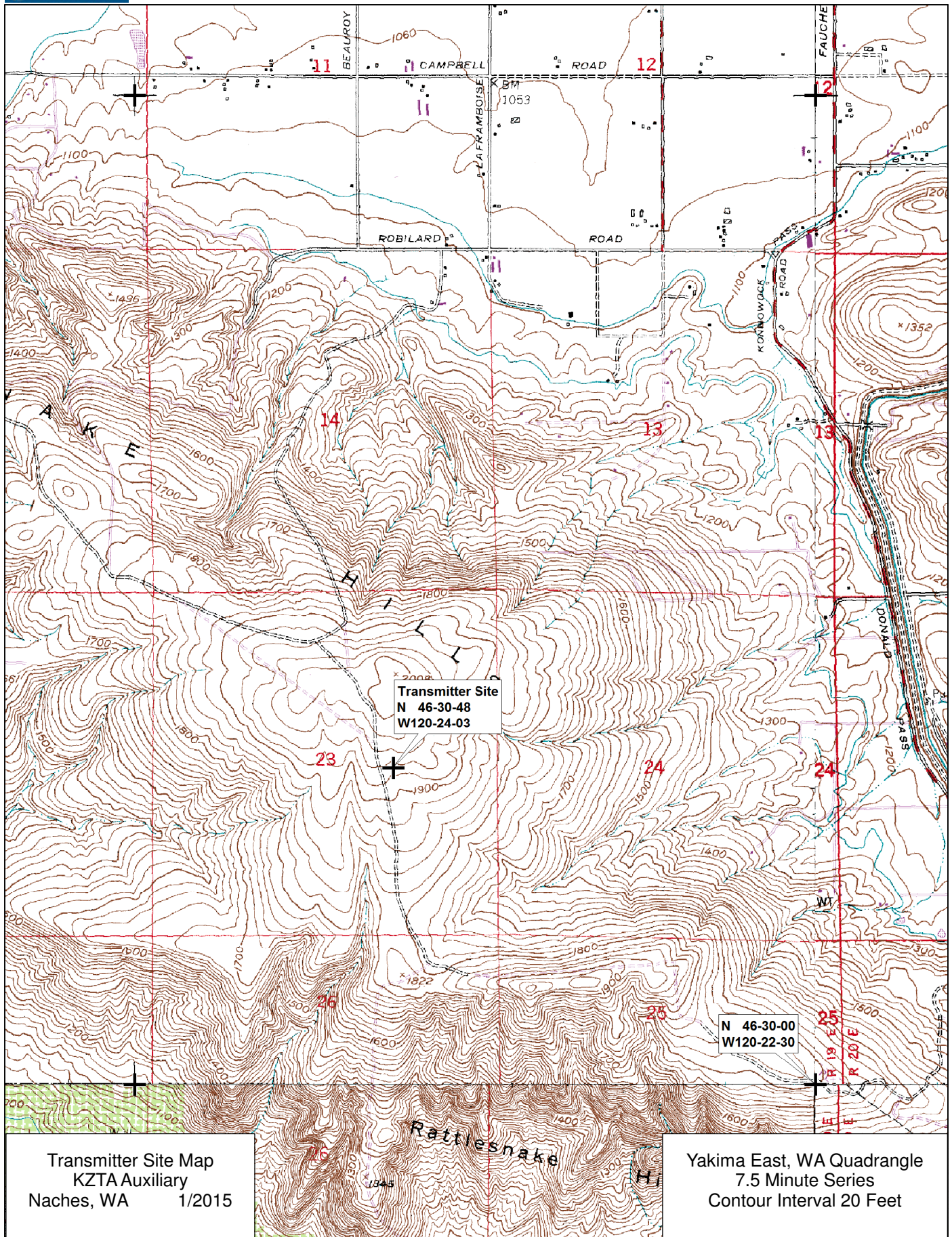
Vertical ERP: 0.875 kW

Antenna Height: 67 meters AGL

Maximum Calculated Power Density is $6.6 \mu\text{W}/\text{cm}^2$ at 15 meters from the antenna structure.

Hatfield & Dawson Consulting Engineers





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