

Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

**KTWS Transmitter Site
Awbrey Butte
Bend, Oregon**

**Report of Measurements & Conclusions
April 21, 2016**

This report details radio frequency radiation (RFR) measurements made on April 21st, 2016, at the transmitter site for KTWS on Awbrey Butte communications site in Bend, Oregon. The measurements detailed herein were made by the undersigned, James Boyd of Boyd Broadcast Technical Services.

The measurement equipment used consists of a Narda Microwave model 8718B RFR meter (SN: 7127) with a model A8722D E-Field probe (SN: 09014). The E-Field probe is broadband with a frequency coverage of 300 kHz to 50 GHz. The instrument set was calibrated on March 22nd, 2016.

The A8722D probe used is a “shaped” probe, meaning that the response to radiofrequency fields follows the 1997 FCC Limits for Maximum Permissible Exposure (MPE) for Occupational/Controlled Exposure, resulting in a display on the 8718B meter of percentage of MPE for Occupational/Controlled Exposure. Because of the frequencies in use at this site, the MPE for General Population/Uncontrolled Exposure limit is one-fifth or 20% of the Occupational/Controlled Exposure limit. Readings in areas where access is available to the General Population (Uncontrolled), were multiplied by a factor of 5.

Measurement techniques used are consistent with generally accepted practices. Steps and procedures used in making these measurements are similar to those printed in Section 3 of OET Bulletin 65, Edition 97-01, August 1997, published by the FCC Office of Engineering and Technology.

KTWS and KLRR are combined into a single FM broadcast antenna side mounted on a tower at this site. A single one story building houses all transmitter equipment. A number of other FM and television broadcast facilities as well as other wireless communications entities are located in the transmitter building and have antennas on the tower structure.

The entire communications site which has a number of high and low power FM broadcast facilities, medium power UHF and VHF television broadcast facilities, land-mobile and cellular facilities, is surrounded by a 6 foot high metal chain link fence with a motorized entry gate accessible only by authorized users. This completely precludes uncontrolled access. The site is therefore deemed Occupational/Controlled. At the time of the measurements, all broadcast stations in the area specified by the FCC to be measured were believed to be operating with licensed facilities and power levels. The measurements made herein were a condition of the construction permit for KTWS.

The power density data gathered in this study, expressed as a percentage of Occupational/Controlled MPE is tabulated on page three. All of the measurements are peak readings.


No areas measured on the property exceed the Occupational/Controlled MPE level.

No areas measured on the property exceed the General Population/Uncontrolled MPE level.

No measurements were made on the tower. Work on antennas on the tower will require shut down of transmitters. Although the entire Awbrey Butte site is fenced and is considered to be Occupational/Controlled, it should be noted maintenance workers such as HVAC technicians, meter readers and others who must visit the site are not considered Occupational and therefore they must be instructed to avoid lingering in areas where RF radiation is highest.

A satellite photo of the site is shown on page four. A topographical map showing the location of the transmitter site is on page five. Pictures of the transmitter site are on pages 6, 7, 8, 9, 10 and 11. The FCC Limits for Maximum Permissible Exposure curve is shown on page 12. A picture of the test equipment used is shown on page 13.

All measurements were made by the undersigned. I am an experienced radio broadcast engineer. I have experience making these measurements. My technical qualifications are a matter of record with the Federal Communications Commission.

A handwritten signature in black ink, appearing to read "J E Boyd", with a long horizontal line extending to the right.

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Tabulated Measurement Data

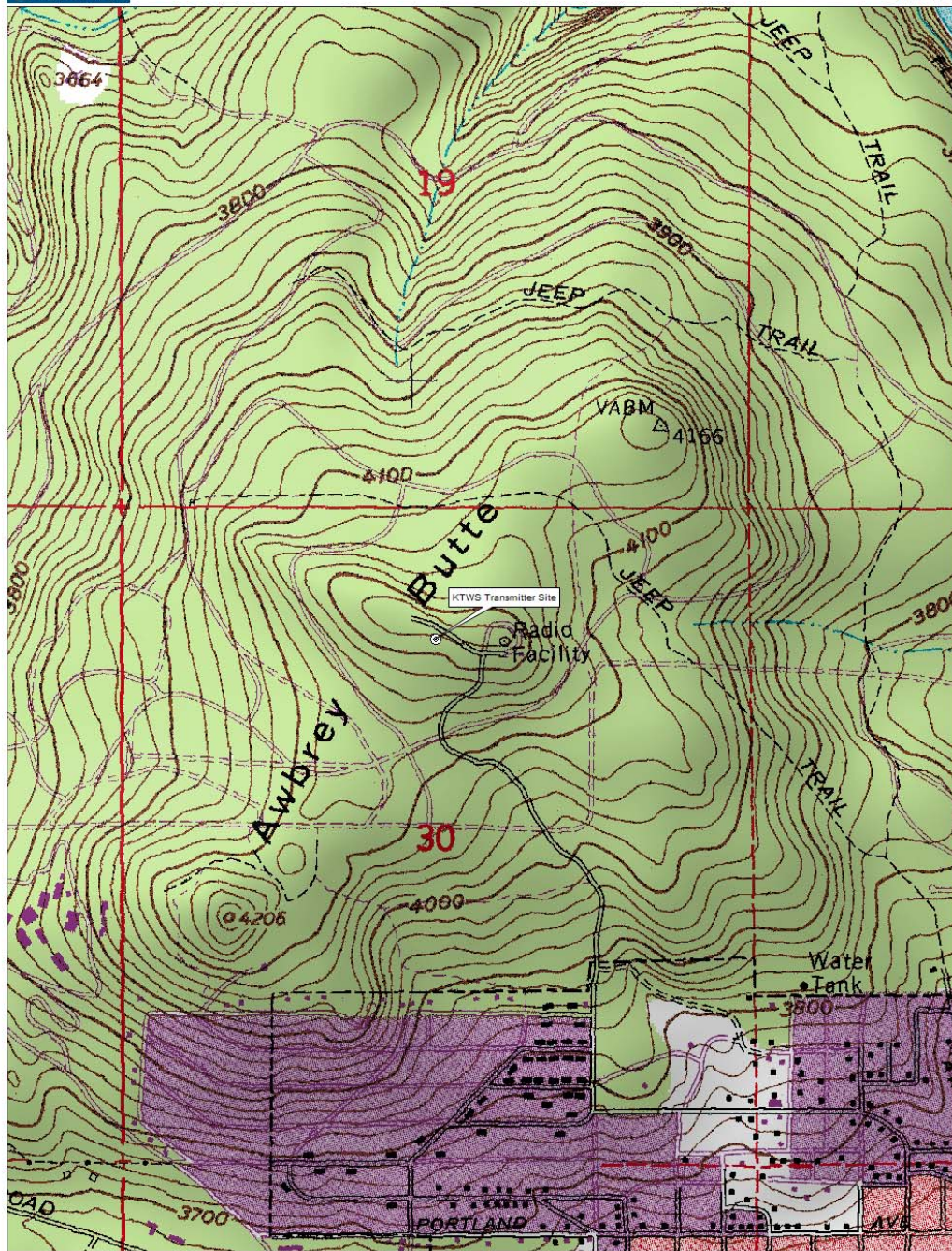
Data as a Percentage of Occupational/Controlled MPE

All are peak readings

• Short paved access road from gate entering site	2.175%
• Dirt road leading to KTWS site	15.58%
• KTWS parking area east side of transmitter Building	13.08%
• Road past KTWS site leading to Century Link building	8.531%
• Northwest guy anchor perimeter fence	4.893%
• Site perimeter fence west and south sides	5.025%
• Southwest guy anchor perimeter fence	4.856%
• East guy anchor perimeter fence	5.456%
• KTWS transmitter building perimeter	7.387%
• Coax ice bridge	4.725%
• Tower base	3.675%
• Inside of transmitter building	6.13%



Satellite view of KTWS Transmitter Site



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MN (14.8° E)

0 120 240 360 480 600 m
Data Zoom 14-0

USGS Topographical Map of Transmitter Site



Entry Road and Locked Entry Gate



Views of perimeter fence at Awbrey Butte communications Site



Exterior pictures of transmitter building



View of tower base

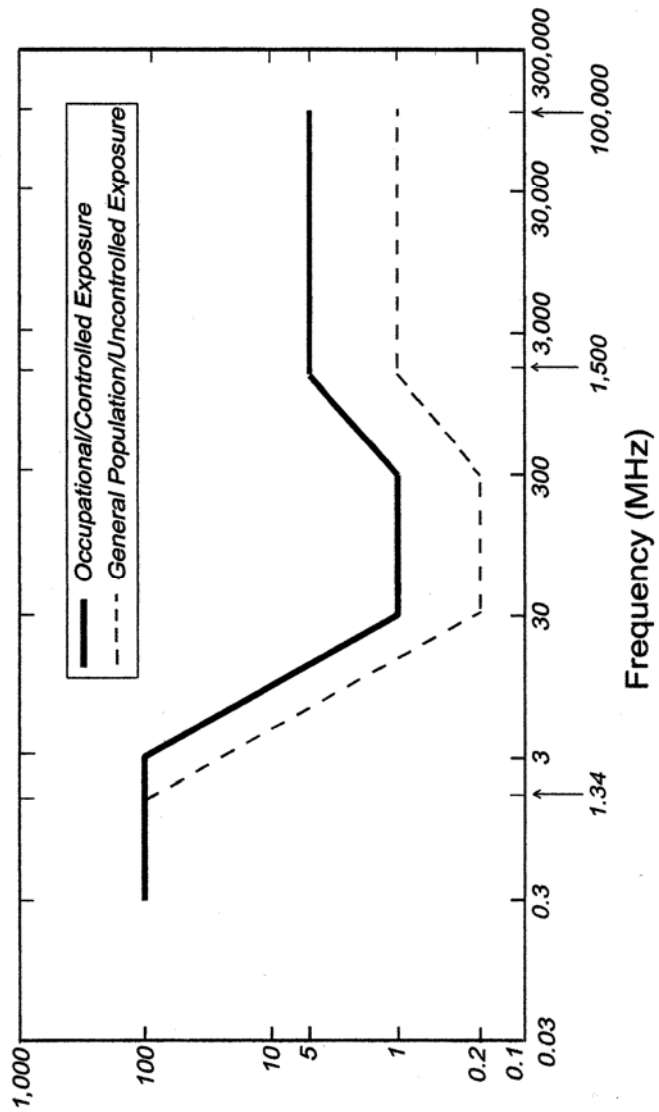


View of tower



Close up view of the KTWS and KLRR common antenna at top of tower

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)
Plane-wave Equivalent Power Density





Narda Test Equipment