

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

**KWWS Transmitter Site
Pikes Peak
Near Walla Walla, Washington**

**Report of Measurements & Conclusions
November 4, 2015**

This report details radio frequency radiation (RFR) measurements made on November 4th, 2015, at the KWWS transmitter site on Pikes Peak southeast of Walla Walla, Washington. The measurements detailed herein were made by 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 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. 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. The FCC Limits for Maximum Permissible Exposure curve is shown on page 13. A picture of the measurement test equipment used is shown on page 14.

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.

KWWS is located on a steel, uniform cross section, guyed tower, 24 meters high. The antenna center of radiation above ground is 18 meters. The tower supports the KWWS Shively 6815-4DA, four bay directional antenna.

The transmitter site is remote. A road runs along the northeast side of the site. A fence runs along the road (southwest side of road) and there is a locked gate on the short, steep access road into the site. Very steep terrain drops down and away on all other sides of the site.

Two 100 kW FM stations (KKSR and KXXR) are located at the same site, but on separate towers. There are also two Class A television stations (KORX-CD, 1 kW ERP and K33EJ-D, 15 kW ERP) located at the site, also on separate towers.

At the time of the measurements, all stations were operating with licensed facilities and power levels. This was verified on site.

The data collected conclusively shows RFR levels in most areas on the site do exceed FCC limits for General Public/Uncontrolled MPE. With one exception nothing (using spatial averaging) at ground level on the site exceeds Occupational/Controlled Exposure limits. Information about this hot spot is detailed on page three. It is also important to note the one area which exceeds the Occupational/Controlled Exposure limit remains at approximately the same level with KWWS on the air and off the air.

Workers in the building at this site are safe at full power levels.

Tower work, of course, requires shut down of the facilities.

KWWS does not own or control the site. However the station will urge the site owner to limit occupational access to the one area which is above limits. KWWS also will develop a safety plan when non-broadcast maintenance personnel representing KWWS must access the site.

A listing of peak RFR levels is shown on page three. A drawing of the site layout is shown on page four. A detailed topographic map of the site is shown on page five. A USGS (NOAA) topographic map is on page six. This map shows how the terrain drops off steeply in all directions. Finally, a series of pictures of the site are shown on pages 7 through 12.

All measurements were made by the undersigned who is an experienced radio broadcast technician and has experience making these measurements. The technical qualifications of the undersigned are a matter of record with the Federal Communications Commission.

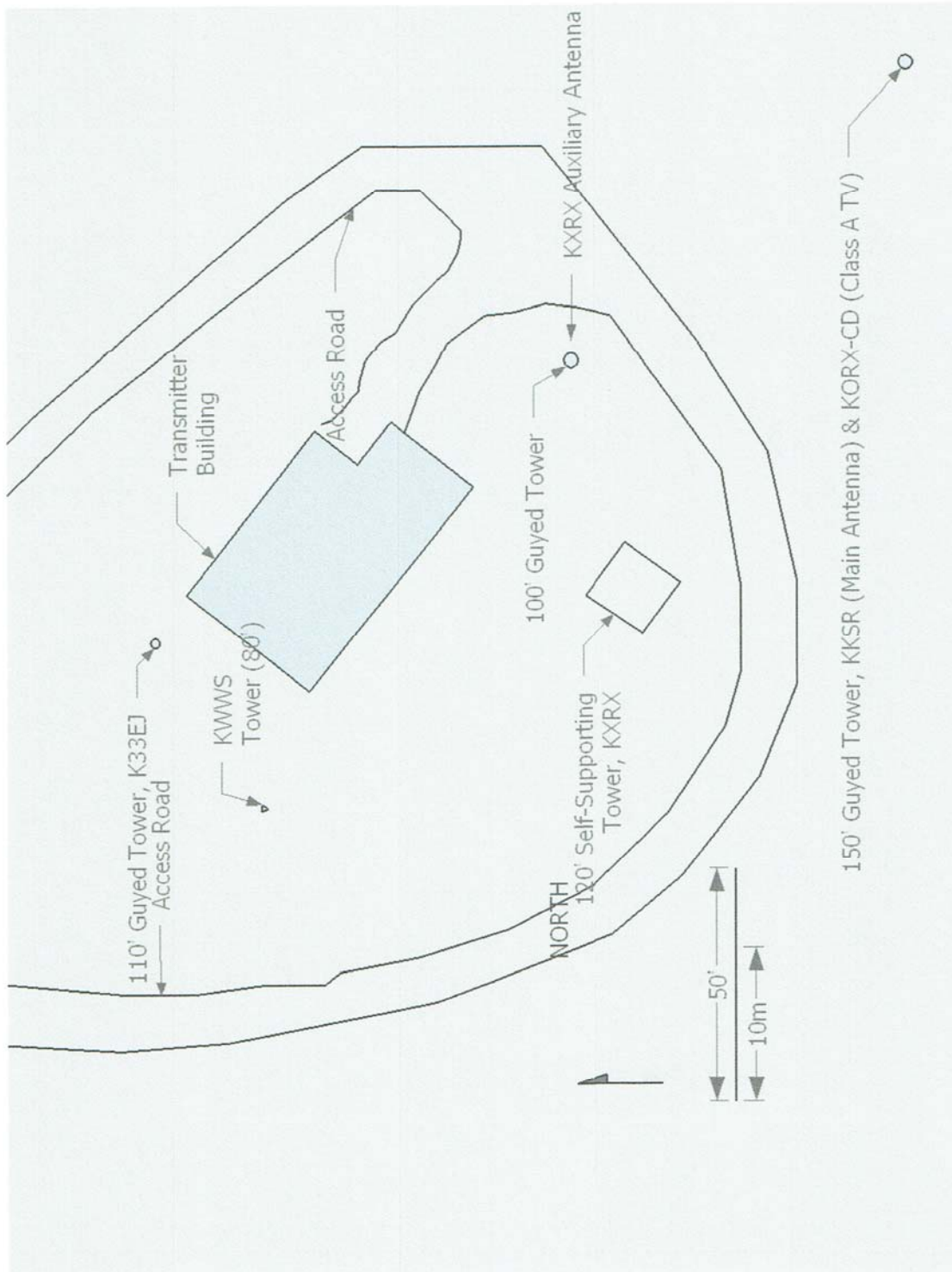
A handwritten signature in dark ink, appearing to read "J E Boyd", with a long horizontal line extending to the right.

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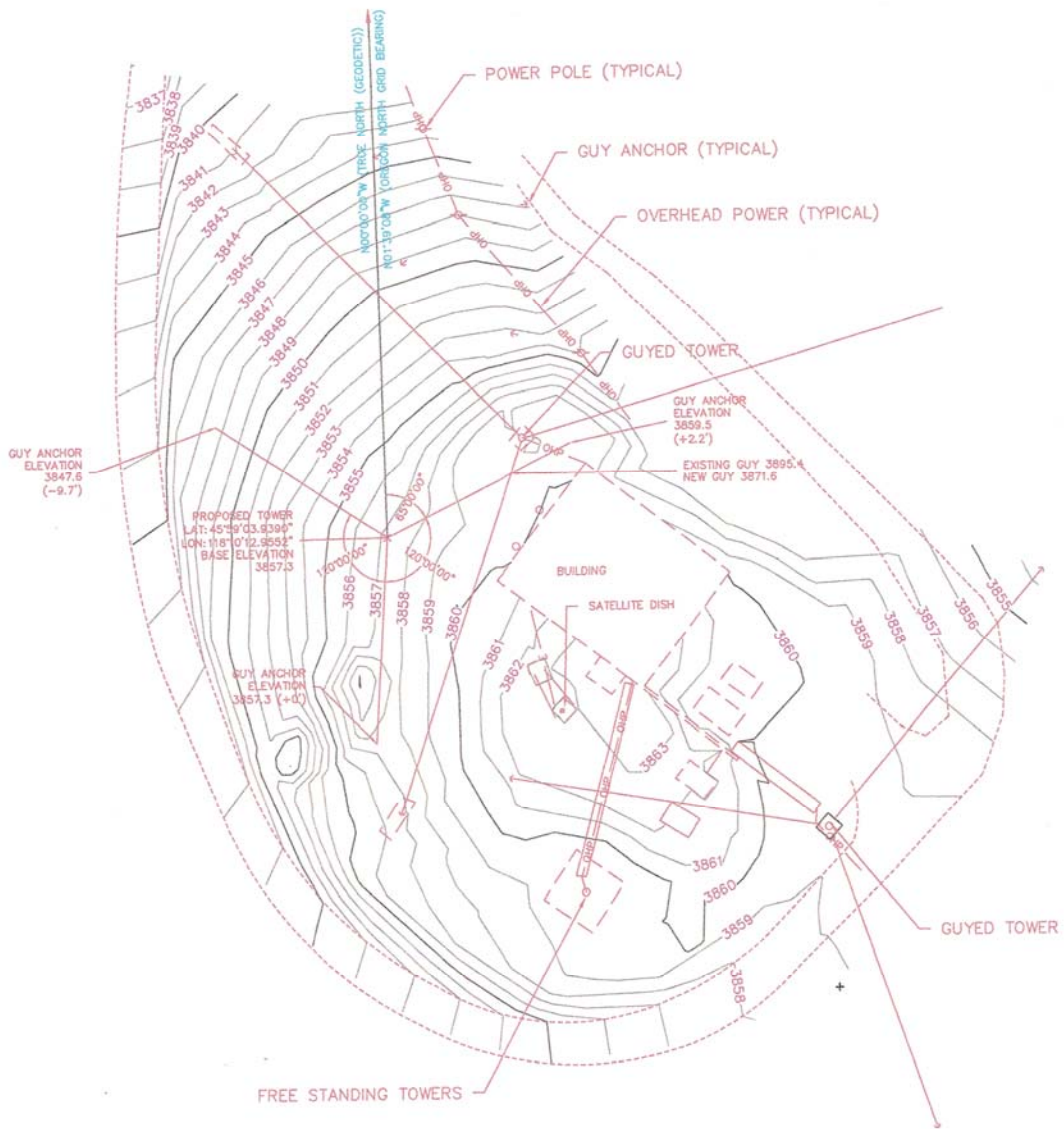
Summary of Peak and Spatially Averaged RFR Levels

On the ground in the main lobe of the KWWS antenna	38.92% (peak) of Occupational/Controlled MPE
KWWS tower guy wire anchors	14.92% (peak) of Occupational/Controlled MPE
Area adjacent to and around generators	53.3% (peak) of Occupational/Controlled MPE
Area in front of power company meters	42.37% (peak) of Occupational/Controlled MPE
Building entry	32.6% of Occupational/Controlled MPE
Inside of transmitter building	13.48% of Occupational/Controlled MPE
Southeast end of fuel tanks	153.7% (peak) and 85.78% (spatially averaged) of Occupational/Controlled MPE
Between fuel tanks	53.71% of Occupational/Controlled MPE
East, southeast base of KXRX self-supporting tower	127.1% (peak) and 93.88% (spatially averaged) of Occupational/Controlled MPE
Other three base sides of KXRX tower	94.1% peak of Occupational/Controlled MPE
Base of KKSR main antenna tower	82.98% peak of Occupational/Controlled MPE
KKSR main antenna tower north guy anchor	28.48% peak of Occupational/Controlled MPE
KKSR main antenna tower southwest guy anchor	96.03% peak of Occupational/Controlled MPE
KKSR main antenna tower east guy anchor	87.35% of Occupational/Controlled MPE
An area about 20 feet by 20 feet at the base and toward the southwest of the KXRX auxiliary antenna tower:	238.6% peak and 110.7% spatially averaged, both exceeding the Occupational/Controlled MPE

**These readings remain substantially the same with KWWS on the air or off the air.
Therefore KWWS does not contribute to this hot spot.**



Site Map



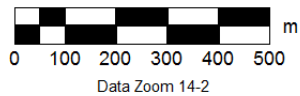
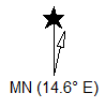
Surveyed topographical map of the KWWS transmitter site



Data use subject to license.

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USGS (NOAA) Topographic Map



Parking area. Generators can be seen to the left of the pickup. Power company meters are behind the generators. Fuel tanks are located to the left of the building.



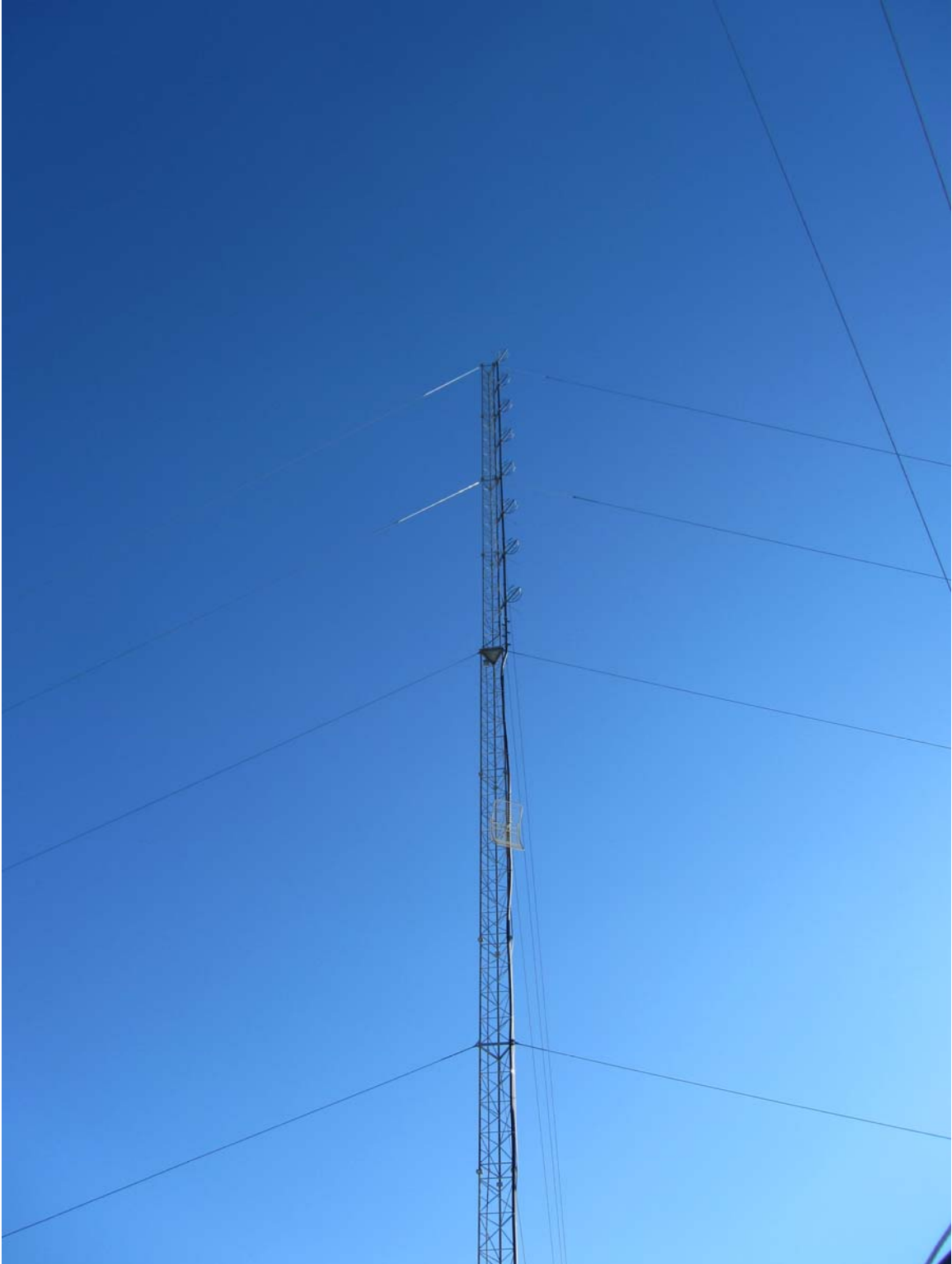
Interior view of transmitter building.



Tower at center of picture is KWWS. Tower to the left is KRRX. Tower to the right has K33EJ-D and KWWS auxiliary antenna.



Picture of KXRK tower and antenna.



KSKR Main tower and antenna

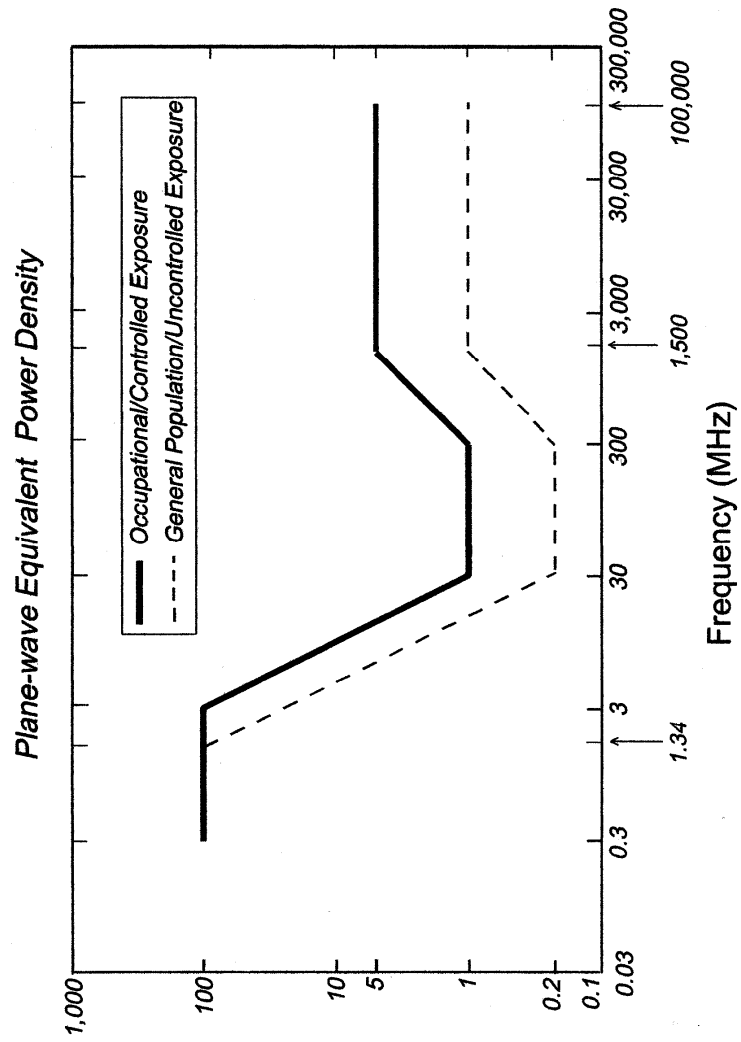


KXRX Auxiliary tower is in foreground. The Occupational/Controlled Environment hotspot is located just to the right of the base of this tower.



KXRX auxiliary tower and antenna.

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)





Narda Test Equipment