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MAURY L. HATFIELD, PE  
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PAUL W. LEONARD, PE  
(1925-2011)

## ENGINEERING REPORT:

### RADIO FREQUENCY EXPOSURE MEASUREMENTS

Prepared for

OREGON PUBLIC BROADCASTING

KOPB-FM - Auxiliary  
Channel 218C0 91.5 MHz  
Portland, Oregon

March 2021

## **INTRODUCTION**

Hatfield & Dawson has been retained to perform the radiofrequency power density measurements around the Skyline tower owned by Skyline Tower, LLC and has many broadcast facilities on this tower. These measurements were made with the KOPB-FM Auxiliary operating. The site is located at 299 NW Skyline Blvd., Portland, OR.

## **SITE ACCESS AND LOCATION**

The tower site is not accessible to the public as it is restricted by a fence with a locked gate. All station personnel and contractors are required to follow safety procedures before any work is commenced on the site. No tower climbing is permitted unless the antennas are off or other coordinated safety plans are followed.

## **MEASUREMENT PROCEDURES**

Measurement procedures outlined in OET BULLETIN 65, (EDITION 97-01), [OET 65] "Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields", ANSI/IEEE Std C95.3-2002, IEEE Recommended Practice for the Measurement and Computation of Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300GHz, and NCRP Report No. 119, "A Practical Guide to the Determination of Human Exposure to Radiofrequency Fields" were used for the measurements taken at the KOPB-FM site. Spatially averaged measurements were made at the points where the highest fields were found.

According to the ANSI C95.3 guidelines (reaffirmed in OET 65), measurements to determine exposure compliance are to be made at distances 20 cm or greater from any object. This is to ensure that the measurements are not contaminated by re-radiation from conductive objects.

The measurements are presented as a percent of the General Population/Uncontrolled Environments Maximum Permissible Exposure (MPE) limit. These Radio Frequency Exposure guidelines are found in CFR 47 §1.1310 *Radiofrequency Radiation Exposure Limits*.

The radiofrequency power density was measured with the KOPB-FM Aux antenna operating and all other facilities believed to be operating at full power using their licensed facilities. These measurements

were made between the hours of 9:00 AM and 10:00 AM on 25 March 2021. Measurements were made by Stephen S. Lockwood, P.E. using the following equipment:

| Make  | Instrument                              | Model S/N      | Calibration |
|-------|-----------------------------------------|----------------|-------------|
| Narda | Broadband Field Meter                   | NBM-550 E-0958 | April 2019  |
| Narda | FCC Occupational Probe 300 kHz – 50 GHz | EF-5091 01112  | April 2019  |

The following high-power (above 100 watts) FM & TV broadcast stations were operating during these measurements:

| Call           | Frequency / Channel | Power (ERP) | Height Above Ground |
|----------------|---------------------|-------------|---------------------|
| KOPB(FM) Aux   | 91.5 MHz            | 41.25 kW    | 135 m (443 ft)      |
| KKRZ(FM)       | 100.3 MHz           | 100.0 kW    | 219 m (719 ft)      |
| KKCW(FM)       | 103.3 MHz           | 100.0 kW    | 219 m (719 ft)      |
| KRSK(FM)       | 105.1 MHz           | 22.5 kW     | 219 m (719 ft)      |
| KFBW(FM)       | 105.9 MHz           | 22.5 kW     | 219 m (719 ft)      |
| KGW            | CH 8                | 45.0 kW     | 272 m (892 ft)      |
| KOPB(DT)       | CH 10               | 46.0 kW     | 273 m (896 ft)      |
| KPTV(DT)       | CH 12               | 24.5 kW     | 313 m (1027 ft)     |
| KOXO-CD        | CH 15               | 8.53 kW     | 183 m (600 ft)      |
| KORS-CD        | CH 16               | 15.0 kW     | 183 m (600 ft)      |
| KOXI-CD        | CH 20               | 13.5 kW     | 183 m (600 ft)      |
| KPXG-LD        | CH 21               | 15.0 kW     | 257.2 m (844 ft)    |
| KPXG-TV        | CH 22               | 1000 kW     | 257.2 m (844 ft)    |
| KGWZ-LD (STA)  | CH 23               | 8.6 kW      | 258 m (846 ft)      |
| KPDx(DT) (STA) | CH 30               | 540 kW      | 297 m (974 ft)      |
| KUNP-LD        | CH 34               | 15.0 kW     | 274.1 m (899 ft)    |
| KORK-CD        | CH 35               | 15.0 kW     | 183 m (600 ft)      |

## **MEASURED FIELDS**

The measured fields around the KOPB-FM transmitter site were below 1.5% of the Occupational/Controlled MPE, and 7.5% of General Population/Uncontrolled Environment MPE limits. The measured field at each location is shown as the spatially averaged field. These values remained unchanged between the licensed operation of KOPB-FM and the auxiliary operation of KOPB-FM.

The highest fields were found 100 meters east of the tower (near the generators), which was 7.5% of the General Population MPE. All other accessible areas on this site are well below this level. These levels are well below the standards and it is therefore safe to say that there is no RF exposure problem at this site.

There are no other areas on this site that were found to exceed the General Population/Uncontrolled Environment MPE limits. This site complies with the FCC requirements of CFR 47 §1.1310 Radiofrequency Radiation Exposure Limits.

## **RECOMMENDATIONS**

As there are generally accessible areas where the RF exposure is above the General Population MPE. The area around the tower has the appropriate signage.

### STATEMENT OF ENGINEER

This Engineering Report and the Radio Frequency Exposure Measurements at the KOPB-FM site have been prepared by the undersigned or under my direct supervision. 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, Alaska, and Wyoming.

Please feel free to contact me should you have any questions.



25 March 2021

Stephen S. Lockwood, P.E.