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Mr. Andy Skotdal  
CAAM Partnership  
2707 Colby Ave. Suite 1380  
Everett, WA. 98201

Re: Exposure to Radio Frequency Field from the proposed KRKO 1380 kHz and 1520 kHz.

Dear Andy;

This letter is to address the issue of safety standards regarding human exposure to radio frequency radiation from AM broadcast stations. The calculations in this letter are based on the facilities for KRKO 1380 kHz and the proposed 1520 kHz.

In the United States, Medium Wave (MW) or AM stations operate on frequencies between 0.54 and 1.7 MHz (540 to 1700 kHz) with antenna input powers of up to 50,000 watts. As with all radio systems, an antenna(s) is/are required to convert the station's signal from electrical energy to electro-magnetic energy, suitable for transmission through the air. At an operating frequency of 1380 kHz, one wavelength is about 713 feet and for 1520 kHz the wavelength is 639 feet. This is why MW transmitters (unlike FM, TV, or Cellular transmitters) use the entire tower framework as the antenna, rather than just as a structure to support an antenna. The power delivered by the transmitter is radiated from the entire length of the AM structure above the base insulator.

The Federal standard for RF exposure is described in: *"An Engineering Assessment of the Potential Impact of Federal Radiation Protection Guidance on the AM, FM, and TV Broadcast Services,"* and calculation methods described in *Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, OET Bulletin 65, August 1997.* Broadcasters are

## **Exposure to Radio Frequency Field from the proposed KRKO 1380 kHz and 1520 kHz**

required to comply with the FCC "Rules & Regulations" *CFR 47 §1.1310, Radiofrequency Radiation Exposure*.

The FCC standard is based on recommendations from the National Council on Radiation Protection and Measurements (NCRP), and on exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and adopted by the American National Standards Institute (ANSI). These standards are based on a specific absorption rate of 4 watts per kilogram, averaged over the entire body. The ANSI/IEEE and NCRP standards and all other standards used in Europe and elsewhere are also based on data that shows that the human body absorbs energy more efficiently at some frequencies than others. As such, the acceptable level of exposure (measured in milliwatts per centimeter squared ( $\text{mW}/\text{cm}^2$ ) or microwatts per centimeter squared ( $\mu\text{W}/\text{cm}^2$ )) varies with frequency. *CFR 47 §1.1310, Radiofrequency Radiation Exposure*, and Table 1 of OET-65, lists the maximum power density in areas accessible to the public to be  $100 \text{ mW}/\text{cm}^2$  (electric field 614 V/m and magnetic field 1.63 A/m) for frequencies below 3 MHz. According to Tables 2 and 4 of Supplement A of OET-65, the distance to comply with the FCC exposure guidelines from a five eighths or one quarter wavelength AM antenna operating at a frequency of 1380 kHz or 1520 kHz and a power of 50 kW (in one antenna) is 4 meters (13.1 Feet). This distance is based on calculations and measurement data taken at various AM transmitter sites, and is a "worst case" evaluation.

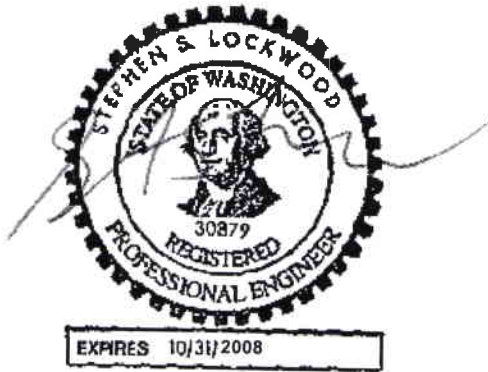
This facility for 1380 kHz and 1520 kHz proposes to share three out of a six total antenna structures. Two of these will be new. The main antenna structure will be 349 feet above ground level and the other five will be 199 feet above ground level. The FCC will require, as a condition of the license, that CAAM Partnership block access to any areas that exceeds the FCC Guidelines. The proposed 1520 kHz antenna structures will be grounded for the first 16 feet and then will have an insulator to isolate energized portion of the structure. These circumstances for both the 349 foot structure and 199 foot structure with 50 kW input power were modeled using *Expert MININEC Broadcast Professional Version 10.0*. This model shows that the FCC exposure guidelines are not exceeded at ground level or at 6 feet above ground level. No shared tower will have a combined total of more than 39 kW.

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With both 1380 kHz and 1520 kHz operating from this co-location facility there are no areas that are accessible from ground level that exceed the FCC exposure guidelines even at a combined output power of 100 kW from one antenna structure. Access to the tower area will be limited to authorized personnel and will be restricted behind a locked gate. After construction this site will be measured to assure that the FCC guidelines are not exceeded. The site will be posted with the appropriate RF hazard warning signs that comply with OET 65 requirements.

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



Sincerely,

Stephen S. Lockwood, P.E.

Hatfield & Dawson Consulting Engineers