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ENGINEERING STATEMENT

Application for License

to Cover Construction Permit

WRTJ, Channel 207A, Coatesville, Pennsylvania

FCC Form 302-FM

20 September 2009

OVERVIEW

The instant application is for license to cover the construction permit of new non-commercial educational FM broadcast station WRTJ, file number BMPED-20070907ADR. **The constructed facility fully complies with all terms of the construction permit.**

NON-DIRECTIONAL ANTENNA

The WRTJ antenna is comprised of a single Shively 6513 radiating element. The antenna is slant-polarized to yield the authorized 460 watts in the vertical polarization plane and 1 watt in the horizontal polarization plane. It is mounted on the tower at the authorized center of radiation height of 73 meters above ground level (AGL).

ENVIRONMENTAL STATEMENT

The proposed modification has been analyzed with respect to OET Bulletin 65 Edition 97-01 entitled *Evaluating Compliance With FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*.

WRTJ operates with antenna center of radiation height of 73 meters AGL with an effective radiated power (ERP) of 460 watts in the vertical polarization plane and 1 watt in the horizontal elevation plane. Using formula (9) in the OET bulletin, the free-space (worst-case) power density is calculated as follows:

$$S = \frac{33.4 \times ERP}{R^2}$$

$$S = \frac{33.4 \times (460V + 1H)}{(73 - 2)^2}$$

$$S = 3.05\ \mu W/cm^2$$

where: S = power density in $\mu W/cm^2$
ERP = power in watts (vertical and horizontal components added together)
R = distance in meters (subtract 2m to account for height of person)

This calculation does not take into account the vertical (elevation) pattern of the antenna, and therefore represents truly a worst-case power density which assumes uniform radiation characteristics at all elevation angles. Nonetheless, the resulting value, 3.05 $\mu W/cm^2$, represents only 1.5 percent of the 200 $\mu W/cm^2$ maximum allowable exposure limit for uncontrolled access.

Standard broadcast station WCOJ 1420 kHz operates using a 4-tower antenna array, the closest tower of which is 0.2 km from the proposed site. WCOJ is authorized for operation at 5.0 kilowatts. The towers comprising the

WCOJ array are slightly over 0.25 wavelength in electrical height. Table 2 in Supplement A to OET 65 Ed. 97-01 specifies a minimum distance for compliance with FCC limits as being only 2 meters from the tower, assuming all of WCOJ's 5.0 kilowatts were radiated from a single tower. As such, given the distance to the proposed facility is 100 times greater than the prescribed distance necessary for compliance, the non-ionizing radiation levels from WCOJ are minimal in the vicinity to the proposed facility.

There also exist several other non-broadcast transmitters operating from the proposed tower site including Part 22 radiotelephone and cellular radiotelephone, Part 24 personal communication services, and Part 90 land mobile radio. These non-broadcast transmitters, all of which are categorically excluded from routine evaluation by virtue of their antennae being mounted well in excess of 10 meters above ground level, contribute a negligible amount to the total power density at or near ground level by virtue of their high antenna heights and low power levels.

Based on the analyses above, it is concluded that the constructed facility is in full compliance with non-ionizing radiation exposure limits and applicable safety standards and regulations.

The antenna tower from which WRTJ operates is an existing structure. The addition of the side-mounted WRTJ antenna did not increase the overall height of the structure. The antenna site is not in a sensitive environmental area. The instant application has no other significant environmental impact. As such, the constructed facility does not require further analysis under 47 CFR §1.1307, and is therefore excluded from further processing per 47 CFR §1.1306.

CERTIFICATION

I, Jeff DePolo, certify that the engineering portion of the instant application, including all associated exhibits, was prepared by Broadcast Sciences LLC on behalf of the applicant, Temple University of the Commonwealth System of Higher Education. The data and exhibits contained therein were generated by me or under my direct supervision. The information, calculations, and analyses provided are true and accurate to the best of my knowledge and belief. I have been employed in the broadcast and wireless communications field for over seventeen years, during which time I have prepared numerous applications deemed acceptable to the Federal Communications Commission. I, and Broadcast Sciences, have served as the applicant's engineering consultants for the past fourteen years. My other qualifications are a matter of record with the Commission.

Jeff DePolo
President, Broadcast Sciences LLC