EXHIBIT A

RADIATION HAZARD STUDY

This radiation hazard study describes the R.F. radiation environment of the permanent fixed Ku-band uplink operated by WMBV in Dixon Mills, AL. This fixed earth station uplink is located at a lattitude of 32d - 07m - 45s North and a longitude of 87d - 44m - 16s West, in Dixon Mills, AL.

This study is done to comply with the requirements of Section 1.1307(b) of the rules of the Federal Communications Commission. All calculations conform to the proceedures presented in OET Bulletin No. 65 for aperature antennas.

Transmit antenna: Prodelin 2.4 meter KU-band

Antenna Diameter $D := 2.4 \cdot m$

Antenna Efficency $\eta := 67 \cdot \%$

Transmitter: 4 watt output flange SSPA, operated at 50% power

Transmit Power $P := 4 \cdot watt \cdot 50 \cdot \%$

$P = 2 \cdot watt$

$mw := \frac{watt}{1000}$

	at 14.0 GHz	at 14.5 GHz
Antenna Gain	$G_1 := 49.10$	$G_2 := 49.30$
Wavelength	$\lambda_1 := 2.14285 \cdot cm$	$\lambda_2 := 2.06896 \cdot cm$

Calculations for the Near Field (Fresnel Region)

Extent of the Near Field

$$R_{n1} := \frac{D^2}{4 \cdot \lambda_1} \qquad R_{n2} := \frac{D^2}{4 \cdot \lambda_2}$$

$$R_{n1} = 67.2 \cdot m \qquad R_{n2} = 69.6 \cdot m$$

Maximum Near Field Power Density

$$S_n := \frac{16 \cdot \eta \cdot P}{\pi \cdot D^2}$$

$$S_n = 0.118 \cdot \frac{mw}{cm^2}$$

Calculations for the Far Field (Fraunhofer Region)

	at 14.0 GHz	at 14.5 GHz
Distance to Far Field	$R_{f1} := \frac{0.6 \cdot D^2}{\lambda_1}$	$R_{f2} := \frac{0.6 \cdot D^2}{\lambda_2}$
	$R_{f1} = 161.281 \cdot m$	$R_{f2} = 167.04 \cdot m$
Absolute Gain of Antenna	$G_{a1} := 10^{\frac{G_1}{10}}$	$G_{a2} := 10^{\frac{G_2}{10}}$
Maximum Far Field Power Density	$S_{f1} := \frac{P \cdot G_{a1}}{4 \cdot \pi \cdot R_{f1}^2}$	$S_{f2} := \frac{P \cdot G_{a2}}{4 \cdot \pi \cdot R_{f2}^2}$
	$S_{f1} = 0.05 \cdot \frac{mw}{cm^2}$	$S_{f2} = 0.049 \cdot \frac{mw}{cm^2}$

Calculations for the Transition Zone

The farthest point in the near field is the beginning of the transition zone -

$$R_{t1} := R_{n2}$$

$$R_{t1} = 69.6 \cdot m$$

The end of the Transition Zone is the beginning of the Far Field -

$$R_{t2} := R_{f2}$$

$$R_{t2} = 167.04 \cdot m$$

	Beginning	End
Transition Zone Power Density	$S_{t1} := \frac{S_n \cdot R_{n2}}{R_{t1}}$	$S_{t2} := \frac{S_n \cdot R_{n2}}{R_{t2}}$
	$S_{t1} = 0.118 \cdot \frac{mw}{cm^2}$	$S_{t2} = 0.049 \cdot \frac{mw}{cm^2}$

Calculations at the Reflector Surface:

Area of Reflector

$$A := \pi \cdot \left(\frac{D}{2}\right)^2$$

$$A = 4.524 \cdot m^2$$

Power Density at the Reflector Surface

$$S_{ref} := \left(2 \cdot \frac{P}{A}\right)$$

$$S_{ref} = 0.088 \cdot \frac{mw}{cm^2}$$

Calculations between the Antenna and the Ground:

Power Density between Antenna and Ground

$$S_{ga} := \frac{P}{A}$$

$$S_{ga} = 0.044 \cdot \frac{mw}{cm^2}$$

Conclusions

The power densities in the Near Field, Far Field, Transition Zone, at the Surface of the Reflector, and between the Reflector and the Ground are all below the allowable limit. Nowhere do they exceed the level of 5 mw/cm^2 as listed in OET Bulletin No. 65. Thus, this transmit earth terminal meets FCC requirements for human exposure to radio frequency energy.