ENVIRONMENTAL IMPACT STATEMENT

Transmit/Receive

In regard to Section 1.1307(a) of the Commission's rules:

This site is not in a designated wilderness area or wildlife preserve; it does not threaten endangered species or critical habitats; nor does it affect sites, structures, or habitats which are significant in American history, architecture, archeology, engineering or culture that are listed or are eligible for listing in the National Registry of Historic Places; it does not affect Indian religious sites or flood plains; nor does it cause significant change in wetland fill, deforestation, or water diversion.

In regard to section 1.1307(b) of the Commission's rules:

We have prepared the calculations of radio frequency radiation for this transmitter and antenna combination, under the operating conditions specified in this application, with these results:

Region	Radiation level (mw/cm^2)	Hazard assessment
Near field	0.237	Complies with guidelines
Far field	0.099	Complies with guidelines
Transition zone	0.237	Complies with guidance
At reflector surface	0.177	Complies with guidance
Between the rim of the antenna and the ground	0.088	Complies with guidance

Conclusions: Based on the study, which is summarized above, we conclude that in the regions of concern, the radiation level complies with the guidance; the level is less than 5 milliwatts per square centimeter.

Accordingly, this action does not have a significant environmental impact as described in the Commission's rules and does not require the preparation of an environmental assessment.

RADIATION HAZARD STUDY

This radiation hazard study describes the R.F. radiation environment of the uplink installed by WRVO. This uplink is located at a latitude of 43 d 27 m 07 s North and a longitude of 76 d 32 m 40 s West, in Oswego, NY.

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 OST 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: Anacom 8 watt output flange SSPA, operated at 50% power

Transmit Power $P = 8 \cdot watt \cdot 50 \cdot \%$

$P = 4 \cdot watt$

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

	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

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

$$S_n = 0.237 \cdot \frac{mw}{cm^2}$$

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	$S_{f1} = \frac{P \cdot G_{a1}}{4 \cdot \pi \cdot R_{f1}^2}$	$S_{f2} = \frac{P \cdot G_{a2}}{4 \cdot \pi \cdot R_{f2}^2}$
	$S_{f1} = 0.099 \cdot \frac{mw}{cm^2}$	$S_{f2} = 0.097 \cdot \frac{mw}{cm^2}$

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	$S_{t1} = \frac{S_n \cdot R_{n2}}{R_{t1}}$	$S_{t2} = \frac{S_n \cdot R_{n2}}{R_{t2}}$
	$S_{t1} = 0.237 \cdot \frac{mw}{cm^2}$	$S_{t2} = 0.099 \cdot \frac{mw}{cm^2}$

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

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

$$S_{ref} = 0.177 \cdot \frac{mw}{cm^2}$$

Calculations between the Antenna and the Ground:

Power Density between Antenna and Ground

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

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

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 OST Bulletin No. 65. Thus, this transmit earth terminal meets FCC requirements for human exposure to radio frequency energy.