EXHIBIT A

RADIATION HAZARD STUDY

This radiation hazard study describes the R.F. radiation environment of the permanent fixed Ku-band R/T earth station terminal operated by Family Life Broadcasting System. This fixed Ku-band R/T earth station terminal is to be located and operated at a lattitude of 35d - 07m - 32s North and a longitude of 106d - 32m - 01s West, in Albuqurque, NM.

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 100% power

Transmit Power $P := 4 \cdot watt \cdot 100 \cdot \%$

$P = 4 \cdot watt$

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

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

EXHIBIT B

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 guidelines
At reflector surface	0.177	Complies with guidelines
Between the rim of the antenna and the ground	0.088	Complies with guidelines

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.

Michael Kirk
(name)

Satellite Engineer
(title or position)

10/11/19
(date)

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

Further Conclusions:
Based on this analysis it is concluded that the FCC RF Guidelines have not been exceeded in the specific regions shown in this report. The applicant proposes to comply with the Maximum Permissible Exposure (MPE) limits of 1 mW/cm2 for the Uncontrolled areas, and the MPE limits of 5 mW/cm2 for the Controlled areas by one or more of the following methods:

Means of Compliance Uncontrolled Areas:
This antenna will be located in a secured area. This area will be sufficient to prohibit access by the general public to the areas that exceed the MPE limited. The general public will not have access to areas within ½ diameter removed from the edge of the antenna.

Since one diameter removed from the main beam of the antenna, or ½ diameter removed from the edge of the antenna, the RF levels are reduced by a factor of 100 or 20 dB. None of the areas exceeding the MPE levels will be accessible by the general public.

Radiation hazard signs will be posted while this earth station is in operation.

The applicant will ensure that no buildings or other obstacles will be in the area that exceed the MPE levels.

Means of Compliance Controlled Areas:
The earth station’s operational personnel will not have access to the areas that exceed the MPE levels while the earth station is in operation.

The transmitters will be turned off during antenna maintenance.

EXHIBIT C

FAA INFORMATION

The proposed 2.4 meter Ku band R/T antenna, which is the subject of this application, is a fixed earth station that will be operated on the roof of an existing building structure. Existing building structures, and surrounding building structures, are higher in elevation (exceed the height) of the proposed antenna. The maximum height of this antenna will be about 3 meters above one of the roof lines/surfaces. Therefore since the proposed antenna does ***not*** extend above existing building structures, notice to the FAA is ***not*** required pursuant to Section 17.4 of the Commission's rules.