

Exhibit E-13

Freespace Interference Study for a given antenna based on Vertical Radiation Pattern

Antenna Make: ETC

Antenna Model: FM-1CP

| <u>Depression Angle from Antenna</u> | <u>Antenna Relative Field</u> | <u>ERP Watts</u> | <u>ERP dBk</u> | <u>Distance to Ground from Antenna (km)</u> | <u>Free Space Signal (dBu)</u> | <u>2.5 dB Loss for Reflection</u> | <u>Signal Strength at Ground (dBu)</u> | <u>Circular Distance From Tower (m)</u> |
|--|---------------------------------------|----------------------|--------------------|---|------------------------------------|---------------------------------------|--|---|
| 90 | 0.010 | 0.001 | -60.00 | 0.0880 | 68.0 | 2.5 | 65.5 | 0.00 |
| 85 | 0.100 | 0.100 | -40.00 | 0.0883 | 88.0 | 2.5 | 85.5 | 7.70 |
| 80 | 0.180 | 0.324 | -34.89 | 0.0894 | 93.0 | 2.5 | 90.5 | 15.52 |
| 75 | 0.250 | 0.625 | -32.04 | 0.0911 | 95.7 | 2.5 | 93.2 | 23.58 |
| 70 | 0.340 | 1.156 | -29.37 | 0.0936 | 98.1 | 2.5 | 95.6 | 32.03 |
| 65 | 0.430 | 1.849 | -27.33 | 0.0971 | 99.8 | 2.5 | 97.3 | 41.04 |
| 60 | 0.500 | 2.500 | -26.02 | 0.1016 | 100.8 | 2.5 | 98.3 | 50.81 |
| 55 | 0.570 | 3.249 | -24.88 | 0.1074 | 101.4 | 2.5 | 98.9 | 61.62 |
| 50 | 0.640 | 4.096 | -23.88 | 0.1149 | 101.8 | 2.5 | 99.3 | 73.84 |
| 45 | 0.700 | 4.900 | -23.10 | 0.1245 | 101.9 | 2.5 | 99.4 | 88.00 |
| 40 | 0.770 | 5.929 | -22.27 | 0.1369 | 101.9 | 2.5 | 99.4 | 104.87 |
| 35 | 0.820 | 6.724 | -21.72 | 0.1534 | 101.5 | 2.5 | 99.0 | 125.68 |
| 30 | 0.870 | 7.569 | -21.21 | 0.1760 | 100.8 | 2.5 | 98.3 | 152.42 |
| 25 | 0.900 | 8.100 | -20.92 | 0.2082 | 99.6 | 2.5 | 97.1 | 188.72 |
| 20 | 0.940 | 8.836 | -20.54 | 0.2573 | 98.2 | 2.5 | 95.7 | 241.78 |
| 15 | 0.970 | 9.409 | -20.26 | 0.3400 | 96.0 | 2.5 | 93.5 | 328.42 |
| 10 | 0.980 | 9.604 | -20.18 | 0.5068 | 92.6 | 2.5 | 90.1 | 499.07 |
| 5 | 0.990 | 9.801 | -20.09 | 1.0097 | 86.7 | 2.5 | 84.2 | 1005.84 |

Distance to Ground Level assumes flat ground or a site where the ground level is above average terrain in all azimuths.

Maximum ERP 10 watts
Radiation Center AG 0.088 km
Radiation Center AG 288.714 ft.

Max dBu to Ground Level

99.42