

# Exhibit E-13

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

Antenna Make: ETC

Antenna Model: FM-1CP

Depression Angle from <u>Antenna</u>	Antenna Relative <u>Field</u>	ERP <u>Watts</u>	ERP <u>dBk</u>	Distance to Ground from <u>Antenna (km)</u>	Free Space <u>Signal (dBu)</u>	2.5 dB Loss <u>for Reflection</u>	Signal Strength <u>at Ground (dBu)</u>	Circular Distance <u>From Tower (m)</u>	<u>ft</u>
90	0.010	0.022	-46.58	0.1260	78.3	0	78.3	0.00	
85	0.100	2.200	-26.58	0.1265	98.3	0	98.3	11.02	36.17
80	0.180	7.128	-21.47	0.1279	103.3	0	103.3	22.22	72.89
75	0.250	13.750	-18.62	0.1304	106.0	0	106.0	33.76	110.77
70	0.340	25.432	-15.95	0.1341	108.4	0	108.4	45.86	150.47
65	0.430	40.678	-13.91	0.1390	110.2	0	110.2	58.75	192.77
60	0.500	55.000	-12.60	0.1455	111.1	0	111.1	72.75	238.68
55	0.570	71.478	-11.46	0.1538	111.7	0	111.7	88.23	289.47
50	0.640	90.112	-10.45	0.1645	112.1	0	112.1	105.73	346.89
45	0.700	107.800	-9.67	0.1782	112.2	0	112.2	126.00	413.41
40	0.770	130.438	-8.85	0.1960	112.2	0	112.2	150.16	492.68
35	0.820	147.928	-8.30	0.2197	111.8	0	111.8	179.95	590.40
30	0.870	166.518	-7.79	0.2520	111.1	0	111.1	218.24	716.04
25	0.900	178.200	-7.49	0.2981	109.9	0	109.9	270.21	886.55
20	0.940	194.392	-7.11	0.3684	108.5	0	108.5	346.18	1135.82
15	0.970	206.998	-6.84	0.4868	106.3	0	106.3	470.24	1542.85
10	0.980	211.288	-6.75	0.7256	103.0	0	103.0	714.58	2344.54
5	0.990	215.622	-6.66	1.4457	97.1	0	97.1	1440.19	4725.25

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

Maximum ERP                      220 watts  
Radiation Center AG            0.126 km  
Radiation Center AG            413.386 ft.

Max dBu to Ground Level                      112.23