



## **ENGINEERING STATEMENT**

### **Exhibit #1**

Concerning the Application of  
University of Massachusetts – Boston

This engineering statement supports the minor change application of the University of Massachusetts – Boston to amend BNPED 20000118ABW, Stow, Massachusetts.

#### **Currently Proposed facilities:**

ERP Horizontal Plane: 0.174 kW, Directional  
ERP Vertical Plane: 0.174 kW, Directional  
HAAT: 74 Meters  
N. Lat 42 27 50  
W. Lng. 71 29 55  
Channel, 219A

#### **Amended Proposed Facilities:**

ERP Horizontal Plane: 0.5 kW, Directional  
ERP Vertical Plane: 0.5 kW, Directional  
HAAT: 23.5 Meters  
N. Lat 42 25 17 NAD 27  
W. Lng. 71 27 10  
Channel 219A

This application is part of a settlement agreement between University of Massachusetts-Boston, Maynard School Committee and Living Proof, Inc. The application on file for Lexington, MA from CSN, International was excluded on the basis of 307B and is not a part of the settlement. The University of Massachusetts – Boston, will share the channel with WAVM, Maynard School Committee, Maynard, Massachusetts- Boston

Page #3 of this Exhibit is a coverage map showing proposed 60 dBu and its service to the principal city, Stow, MA. Page #4 is a distance to contour table showing the distances to the proposed 60 dBu along the eight cardinal radials used to calculate the station's HAAT.

Page #6-9 of this exhibit explains the proposed use of a directional antenna pattern. These pages contain the custom composite azimuth pattern and the vertical elevation field pattern along with a description of how the directionality will be achieved. Page #10 of this exhibit is a statement of the qualifications of the preparer.

**Exhibit 15** is a complete allocation study showing that there are no contour overlaps with any construction permits, licenses or valid applications.

**Exhibit 18** is a channel-six TV exhibit, showing that all provisions of Section 73.525 of the Commission's Rules and Regulation with regard to protection of channel-six TV are met.

The proposed facility is located 288.8 kilometers from the US border with Canada. There are no relevant Canadian stations, construction permits or applications that have a frequency and distance relationship with the proposed facility. (See the channel-study in **Exhibit #21 – Allocation Study**) The proposed facility is not within the specified critical distances to AM broadcast towers and the proposed facility does not cause an impact to FCC monitoring stations, Table Mountain and the West Virginia Quiet Zone.

**Exhibit 22** is an RF hazard statement showing that workers and the general public are protected from excess radio frequency emissions.

The applicant is aware of its responsibility under the rules to correct any blanketing interference it may cause within the period of one year from commencement of transmissions of newly authorized facilities.

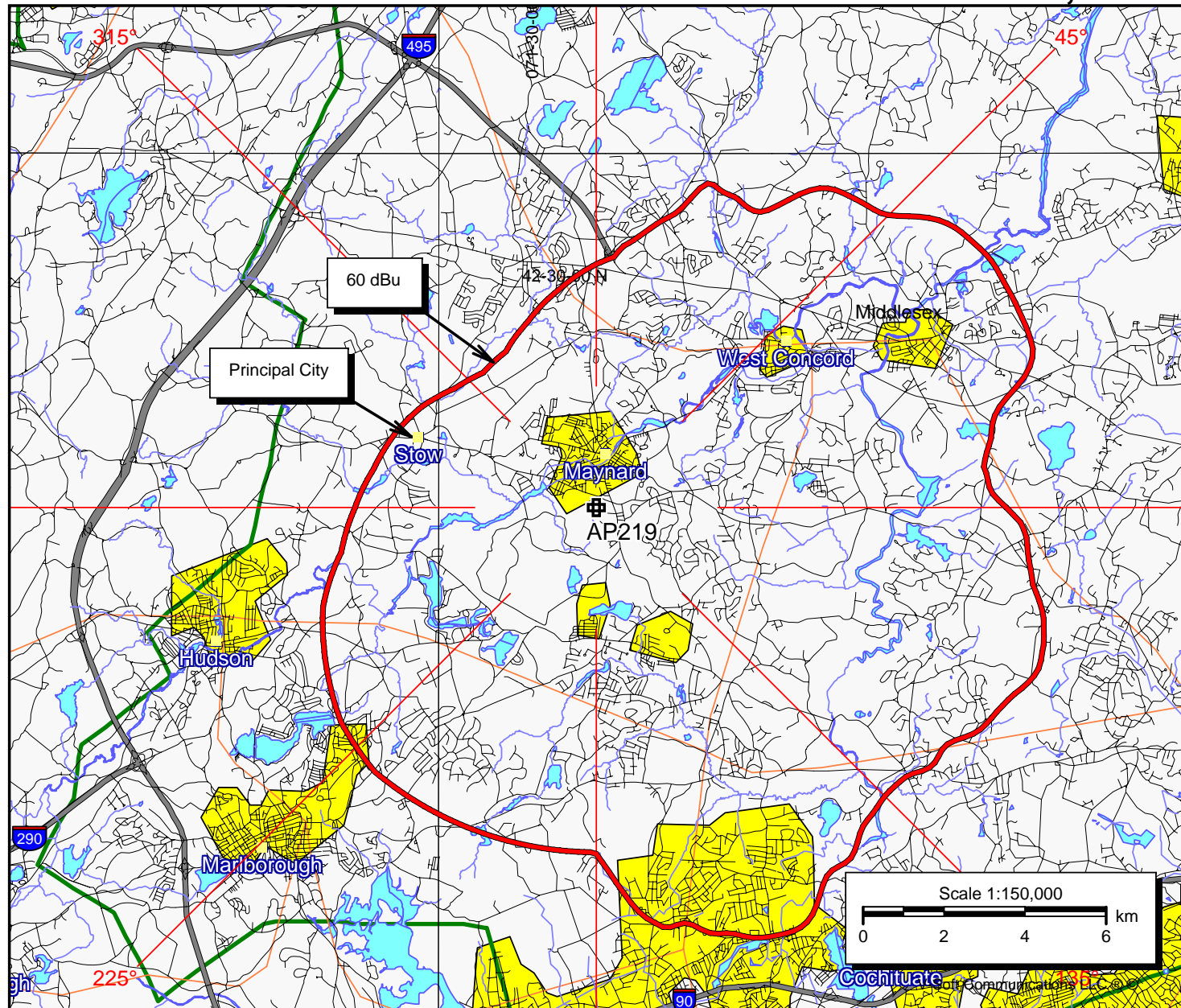
Doug Vernier

## 60 dBu Service to Stow, MA

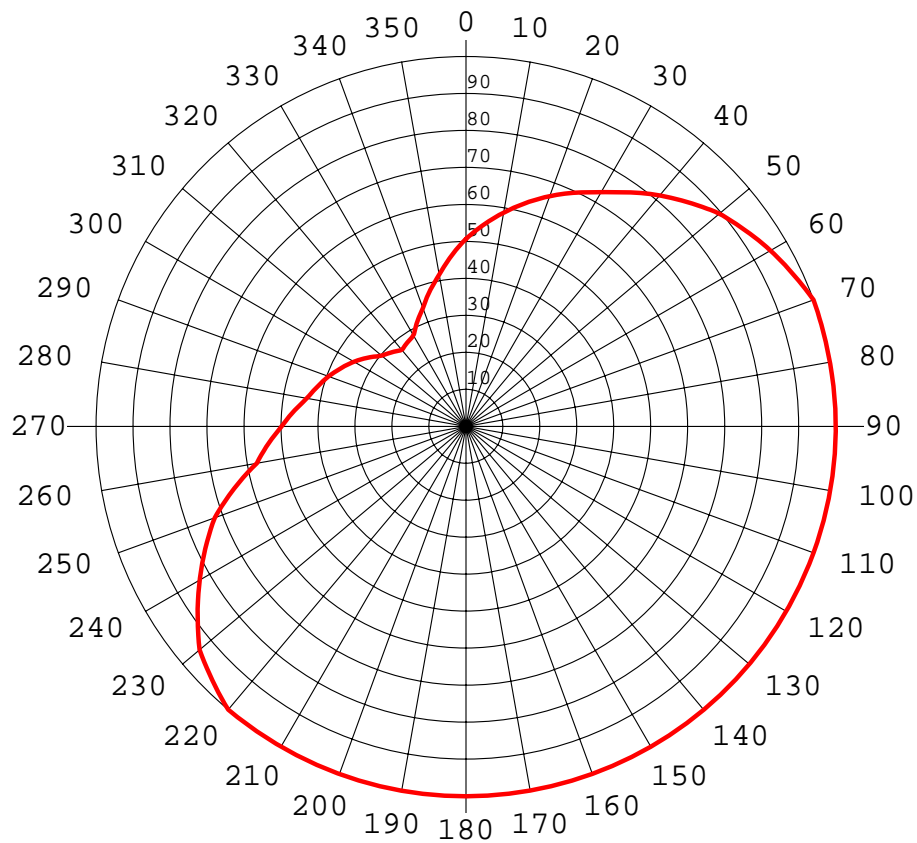
### Service to Stow, MA AP219

Latitude: 42-25-17 N  
Longitude: 071-27-10 W  
ERP: 0.50 kW  
Channel: 219  
Frequency: 91.7 MHz  
AMSL Height: 100.0 m  
Elevation: 69 M  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: FCC

60 dBu Population: 72,191  
Area: 232.61 sq. km

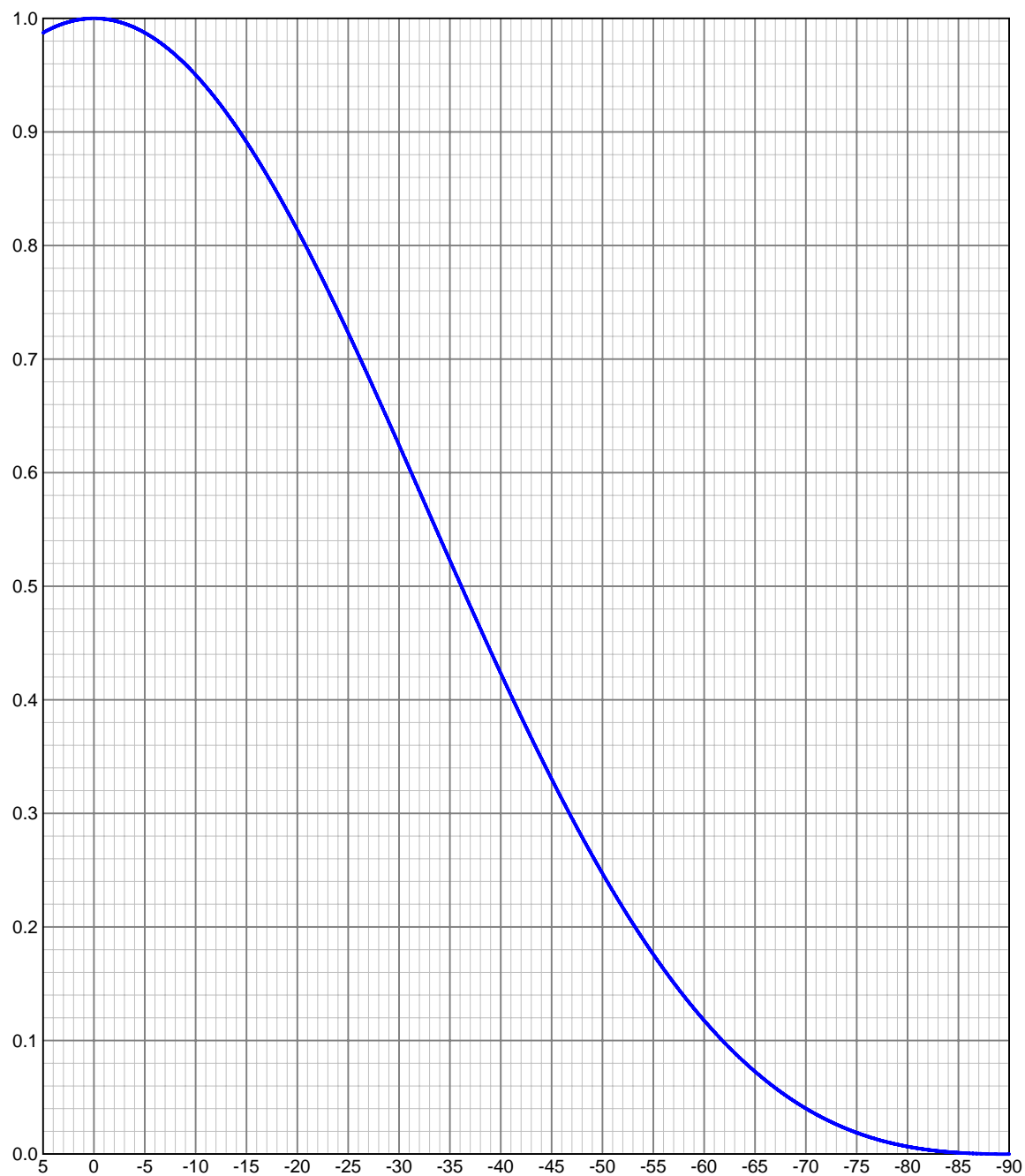


# Custom Composite Pattern



Azi	Rel	dBk	kW	dB	Azi	Rel	dBk	kW	dB
0	0.507	-8.91	0.129	-5.90	180	1.000	-3.01	0.500	0.00
10	0.587	-7.64	0.172	-4.63	190	1.000	-3.01	0.500	0.00
20	0.663	-6.58	0.220	-3.57	200	1.000	-3.01	0.500	0.00
30	0.730	-5.74	0.266	-2.73	210	1.000	-3.01	0.500	0.00
40	0.815	-4.79	0.332	-1.78	220	1.000	-3.01	0.500	0.00
50	0.895	-3.97	0.401	-0.96	230	0.940	-3.55	0.442	-0.54
60	0.951	-3.45	0.452	-0.44	240	0.831	-4.62	0.345	-1.61
70	1.000	-3.01	0.500	0.00	250	0.723	-5.83	0.261	-2.82
80	1.000	-3.02	0.499	0.00	260	0.574	-7.83	0.165	-4.82
90	1.000	-3.01	0.500	0.00	270	0.498	-9.07	0.124	-6.06
100	1.000	-3.01	0.500	0.00	280	0.436	-10.22	0.095	-7.21
110	1.000	-3.01	0.500	0.00	290	0.395	-11.08	0.078	-8.07
120	1.000	-3.01	0.500	0.00	300	0.350	-12.13	0.061	-9.12
130	1.000	-3.01	0.500	0.00	310	0.297	-13.56	0.044	-10.54
140	1.000	-3.01	0.500	0.00	320	0.269	-14.40	0.036	-11.39
150	1.000	-3.01	0.500	0.00	330	0.283	-13.97	0.040	-10.96
160	1.000	-3.01	0.500	0.00	340	0.340	-12.38	0.058	-9.37
170	1.000	-3.01	0.500	0.00	350	0.416	-10.63	0.087	-7.62

Rotation Angle = 0

**ELEVATION PATTERN****Type:****LPX2H****Channel:****210****Directivity:****Numeric****dBd****Location:****Main Lobe:****0.70****-1.54****Beam Tilt:****0.00****Horizontal:****0.70****-1.54****Polarization:****Circular****Relative Field**

## TABULATED DATA FOR ELEVATION PATTERN

Type: LPX2H

Polarization: Circular

ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	ANGLEFIELD	dB	
5.00	0.987	-0.11	-6.75	0.977	-0.20	-27.00	0.684	-3.30	-50.50	0.239	-12.42	-74.00	0.022	-33.03
4.75	0.989	-0.10	-7.00	0.975	-0.22	-27.50	0.674	-3.42	-51.00	0.232	-12.70	-74.50	0.021	-33.75
4.50	0.990	-0.09	-7.25	0.974	-0.23	-28.00	0.664	-3.55	-51.50	0.224	-12.98	-75.00	0.019	-34.50
4.25	0.991	-0.08	-7.50	0.972	-0.25	-28.50	0.654	-3.68	-52.00	0.217	-13.27	-75.50	0.017	-35.27
4.00	0.992	-0.07	-7.75	0.970	-0.27	-29.00	0.644	-3.82	-52.50	0.210	-13.56	-76.00	0.016	-36.06
3.75	0.993	-0.06	-8.00	0.968	-0.28	-29.50	0.634	-3.95	-53.00	0.203	-13.86	-76.50	0.014	-36.88
3.50	0.994	-0.05	-8.25	0.966	-0.30	-30.00	0.624	-4.09	-53.50	0.196	-14.16	-77.00	0.013	-37.73
3.25	0.995	-0.05	-8.50	0.964	-0.32	-30.50	0.614	-4.23	-54.00	0.189	-14.47	-77.50	0.012	-38.61
3.00	0.995	-0.04	-8.75	0.962	-0.34	-31.00	0.604	-4.38	-54.50	0.182	-14.78	-78.00	0.011	-39.53
2.75	0.996	-0.03	-9.00	0.960	-0.36	-31.50	0.594	-4.53	-55.00	0.176	-15.10	-78.50	0.009	-40.48
2.50	0.997	-0.03	-9.25	0.957	-0.38	-32.00	0.584	-4.68	-55.50	0.169	-15.42	-79.00	0.008	-41.46
2.25	0.997	-0.02	-9.50	0.955	-0.40	-32.50	0.574	-4.83	-56.00	0.163	-15.75	-79.50	0.008	-42.50
2.00	0.998	-0.02	-9.75	0.953	-0.42	-33.00	0.563	-4.98	-56.50	0.157	-16.08	-80.00	0.007	-43.57
1.75	0.998	-0.01	-10.00	0.950	-0.44	-33.50	0.553	-5.14	-57.00	0.151	-16.42	-80.50	0.006	-44.70
1.50	0.999	-0.01	-10.50	0.945	-0.49	-34.00	0.543	-5.30	-57.50	0.145	-16.77	-81.00	0.005	-45.88
1.25	0.999	-0.01	-11.00	0.940	-0.54	-34.50	0.533	-5.47	-58.00	0.139	-17.12	-81.50	0.004	-47.13
1.00	0.999	0.00	-11.50	0.935	-0.59	-35.00	0.523	-5.63	-58.50	0.134	-17.48	-82.00	0.004	-48.44
0.75	1.000	0.00	-12.00	0.929	-0.64	-35.50	0.513	-5.80	-59.00	0.128	-17.84	-82.50	0.003	-49.83
0.50	1.000	0.00	-12.50	0.923	-0.69	-36.00	0.503	-5.98	-59.50	0.123	-18.21	-83.00	0.003	-51.30
0.25	1.000	0.00	-13.00	0.917	-0.75	-36.50	0.492	-6.15	-60.00	0.118	-18.59	-83.50	0.002	-52.87
0.00	1.000	0.00	-13.50	0.911	-0.81	-37.00	0.482	-6.33	-60.50	0.113	-18.98	-84.00	0.002	-54.56
-0.25	1.000	0.00	-14.00	0.905	-0.87	-37.50	0.472	-6.51	-61.00	0.108	-19.37	-84.50	0.002	-56.38
-0.50	1.000	0.00	-14.50	0.898	-0.94	-38.00	0.463	-6.70	-61.50	0.103	-19.76	-85.00	0.001	-58.36
-0.75	1.000	0.00	-15.00	0.891	-1.00	-38.50	0.453	-6.88	-62.00	0.098	-20.17	-85.50	0.001	-60.52
-1.00	0.999	0.00	-15.50	0.884	-1.07	-39.00	0.443	-7.08	-62.50	0.093	-20.58	-86.00	0.001	-62.91
-1.25	0.999	-0.01	-16.00	0.877	-1.14	-39.50	0.433	-7.27	-63.00	0.089	-21.01	-86.50	0.001	-65.59
-1.50	0.999	-0.01	-16.50	0.870	-1.21	-40.00	0.423	-7.47	-63.50	0.085	-21.44	-87.00	0.000	-68.64
-1.75	0.998	-0.01	-17.00	0.862	-1.29	-40.50	0.414	-7.67	-64.00	0.081	-21.87	-87.50	0.000	-72.20
-2.00	0.998	-0.02	-17.50	0.854	-1.37	-41.00	0.404	-7.87	-64.50	0.077	-22.32	-88.00	0.000	-76.49
-2.25	0.997	-0.02	-18.00	0.847	-1.45	-41.50	0.395	-8.08	-65.00	0.073	-22.78	-88.50	0.000	-81.92
-2.50	0.997	-0.03	-18.50	0.839	-1.53	-42.00	0.385	-8.29	-65.50	0.069	-23.24	-89.00	0.000	-89.42
-2.75	0.996	-0.03	-19.00	0.831	-1.61	-42.50	0.376	-8.50	-66.00	0.065	-23.72	-89.50	0.000	-101.95
-3.00	0.995	-0.04	-19.50	0.822	-1.70	-43.00	0.367	-8.72	-66.50	0.062	-24.20	-90.00	0.000	-409.33
-3.25	0.995	-0.05	-20.00	0.814	-1.79	-43.50	0.357	-8.94	-67.00	0.058	-24.70			
-3.50	0.994	-0.05	-20.50	0.805	-1.88	-44.00	0.348	-9.16	-67.50	0.055	-25.20			
-3.75	0.993	-0.06	-21.00	0.797	-1.98	-44.50	0.339	-9.39	-68.00	0.052	-25.72			
-4.00	0.992	-0.07	-21.50	0.788	-2.07	-45.00	0.330	-9.62	-68.50	0.049	-26.25			
-4.25	0.991	-0.08	-22.00	0.779	-2.17	-45.50	0.322	-9.86	-69.00	0.046	-26.79			
-4.50	0.990	-0.09	-22.50	0.770	-2.27	-46.00	0.313	-10.09	-69.50	0.043	-27.35			
-4.75	0.989	-0.10	-23.00	0.761	-2.38	-46.50	0.304	-10.34	-70.00	0.040	-27.92			
-5.00	0.987	-0.11	-23.50	0.751	-2.48	-47.00	0.296	-10.58	-70.50	0.038	-28.50			
-5.25	0.986	-0.12	-24.00	0.742	-2.59	-47.50	0.287	-10.83	-71.00	0.035	-29.10			
-5.50	0.985	-0.13	-24.50	0.733	-2.70	-48.00	0.279	-11.09	-71.50	0.033	-29.71			
-5.75	0.983	-0.15	-25.00	0.723	-2.82	-48.50	0.271	-11.34	-72.00	0.030	-30.34			
-6.00	0.982	-0.16	-25.50	0.714	-2.93	-49.00	0.263	-11.61	-72.50	0.028	-30.98			
-6.25	0.980	-0.17	-26.00	0.704	-3.05	-49.50	0.255	-11.87	-73.00	0.026	-31.65			
-6.50	0.979	-0.19	-26.50	0.694	-3.17	-50.00	0.247	-12.14	-73.50	0.024	-32.33			

## **Directional Antenna**

The proposed custom directional antenna pattern meets the Commission's rules in that the radio frequency emission does not change more than two dB for each ten degrees of azimuthal variation. Also, the maximum pattern attenuation in the deepest null is less than 15 dB. The pattern shown is a composite of the maximum field values in the horizontal and vertical planes.

The proposed antenna will be mounted on the sides of a post that has been specified by the antenna manufacturer in accordance with the instructions provided by the manufacturer. The antenna will not be mounted on the top of a tower that includes a top mounted platform larger than the nominal cross-sectional area of the tower in the horizontal plane. No other antennas of any type will be mounted at the same tower level as the directional antenna nor within the horizontal or vertical distance specified by the manufacturer as being necessary to maintain proper directional operation. The antenna will be designed and tested by a major manufacturer of broadcast antennas known to the Commission. The pattern will be achieved through traditional methods including power-splitting, resonators and phasing.

**Declaration:**

I, Douglas L. Vernier, declare that I have received training as an engineer from the University of Michigan School of Engineering. That, I have received degrees from the University in the field of Broadcast Telecommunications. That, I have been active in broadcast consulting for over 30 years;

That, I have held a Federal Communications Commission First Class Radiotelephone License continually since 1964. In 1985, this license was reissued by the Commission as a lifetime General Radiotelephone license no. PG-16-16464;

That, I am certified as a Professional Broadcast Engineer (#50258) by the Society of Broadcast Engineers, Indianapolis, Indiana. (Re-certified 1/2006.)

That, my qualifications are a matter of record with the Federal Communications Commission;

That, I have been retained by the University of Massachusetts to prepare the engineering showings appended hereto:

That, I have prepared these broadcast engineering showings, the technical information contained in same and the facts stated within are true of my knowledge;

That, under penalty of perjury, I declare that the foregoing is correct.

Douglas L. Vernier

A handwritten signature in blue ink, appearing to read "Doug Vernier", with a large, stylized initial "D" and a horizontal line extending to the right.

Executed on July 3, 2007