

## **Engineering Exhibit**

### **FCC Form 302 Application for License WSUM(FM), Madison, Wisconsin University of Wisconsin System**

This Statement and included figures have been prepared by B. Benjamin Evans, P.E. of Evans Associates, Consulting Communications Engineers in Thiensville, Wisconsin, on behalf of the University of Wisconsin System, permittee of noncommercial FM broadcast station WSUM(FM) in Madison, Wisconsin, assigned to operate on Channel 219A (91.7 MHz). This exhibit is in support of an application for license to cover construction permit BMPED-19990429IB to build this new facility. The construction of this new station is nearly complete, and WSUM is expected to begin transmissions on or about February 22, 2002. WSUM is authorized to operate with a directional antenna. The purpose of this exhibit is to demonstrate that WSUM is in compliance with §73.316 of the FCC Rules regarding the requirements of a directional antenna.

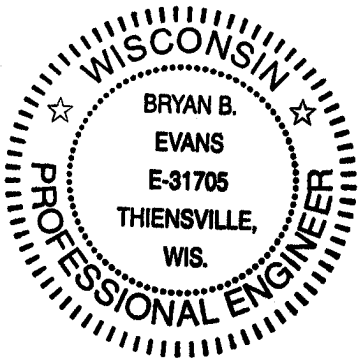
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This engineer certifies that:

1. The WSUM antenna is side-mounted on the antenna tower in accordance with specific instructions provided by Jampro Antennas, the manufacturer of the antenna;
2. The antenna tower does not include a top-mounted platform larger than the nominal cross-sectional area of the tower in the horizontal plane;
3. No other antenna of any type is mounted on the same tower level as the WSUM antenna, and no antenna of any type is mounted within the horizontal or vertical distances specified by Jampro as being necessary for proper directional operation;
4. An experienced broadcast engineer has certified that the antenna has been installed pursuant to Jampro's instructions (see attachment);
5. A licensed surveyor has certified that the installed antenna is properly oriented (see attachment);
6. The RMS of the composite measured pattern is 0.490, compared to the RMS of the authorized pattern envelope, which is 0.538, thus exceeding the 85% requirement by 6 per cent;

7. WSUM, using the measured composite pattern to calculate the projected F(50,50) 60 dBu contour, covers more than half of the city of Madison, the community of license (see Figure 3).

The foregoing statement and included figures are true and accurate to the best of my knowledge and belief.



A handwritten signature in cursive script, appearing to read "Bryan B. Evans".

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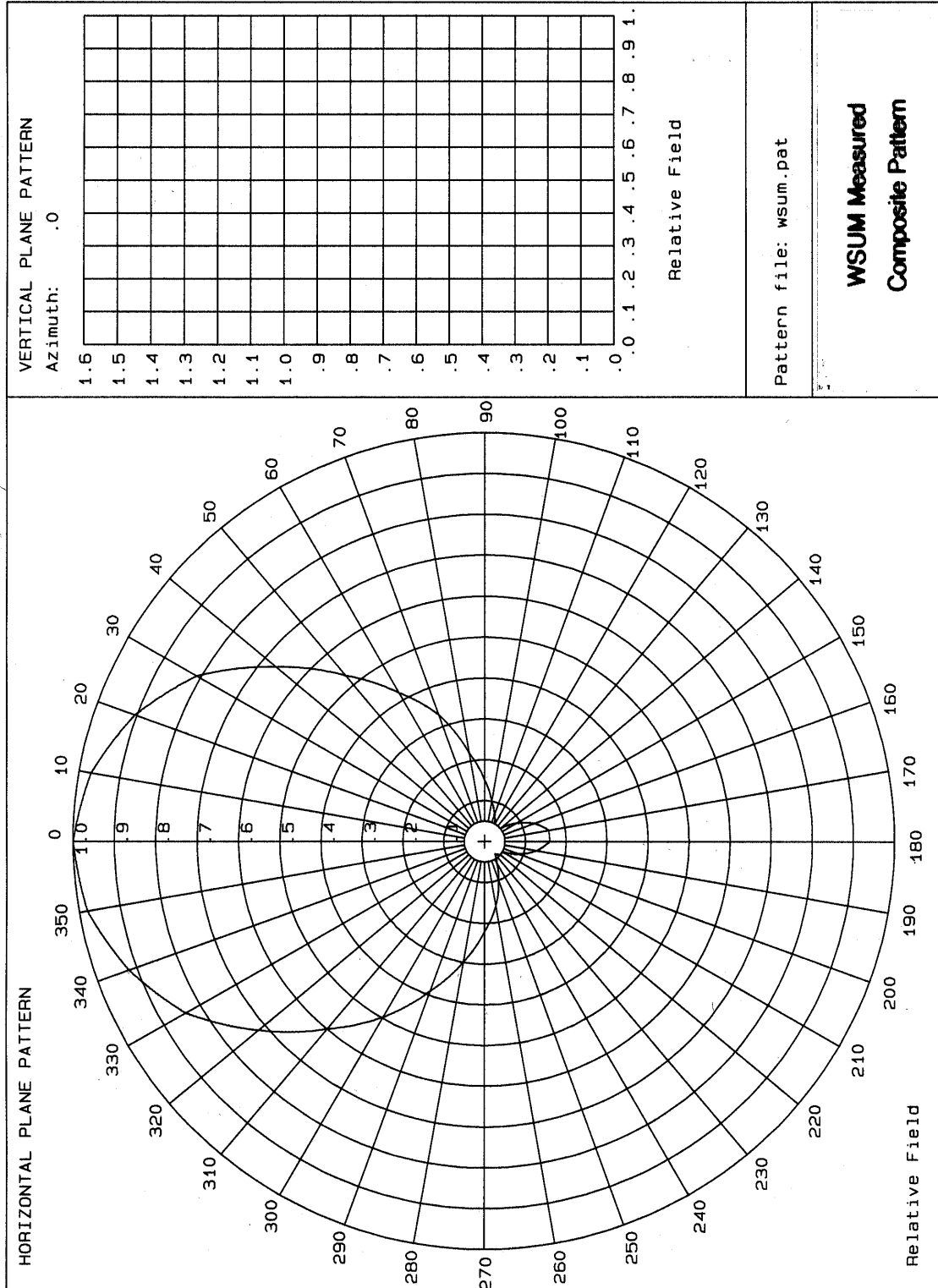
B. Benjamin Evans, P.E.

February 19, 2002

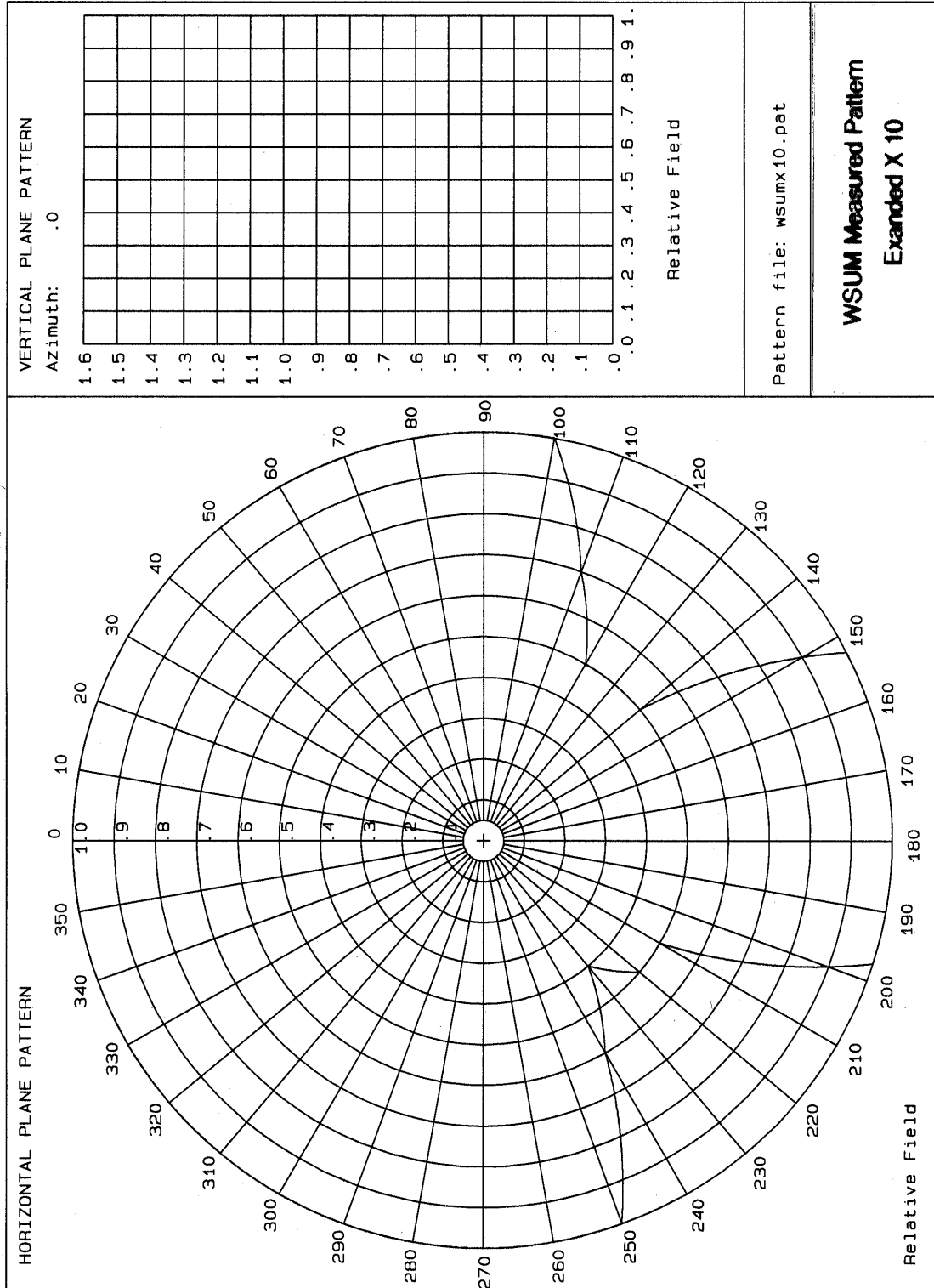
**Included Figures:**

- Figure 1-A - - - Polar Plot in Relative Field of Measured Composite Pattern
- Figure 1-B - - - Polar Plot Expanded Times Ten to Show Fields Less Than 10%
- Figure 2 - - - Tabulation of Relative Fields of Measured Composite Pattern
- Figure 3 - - - Map Showing City of License Coverage

**Figure 1-A**



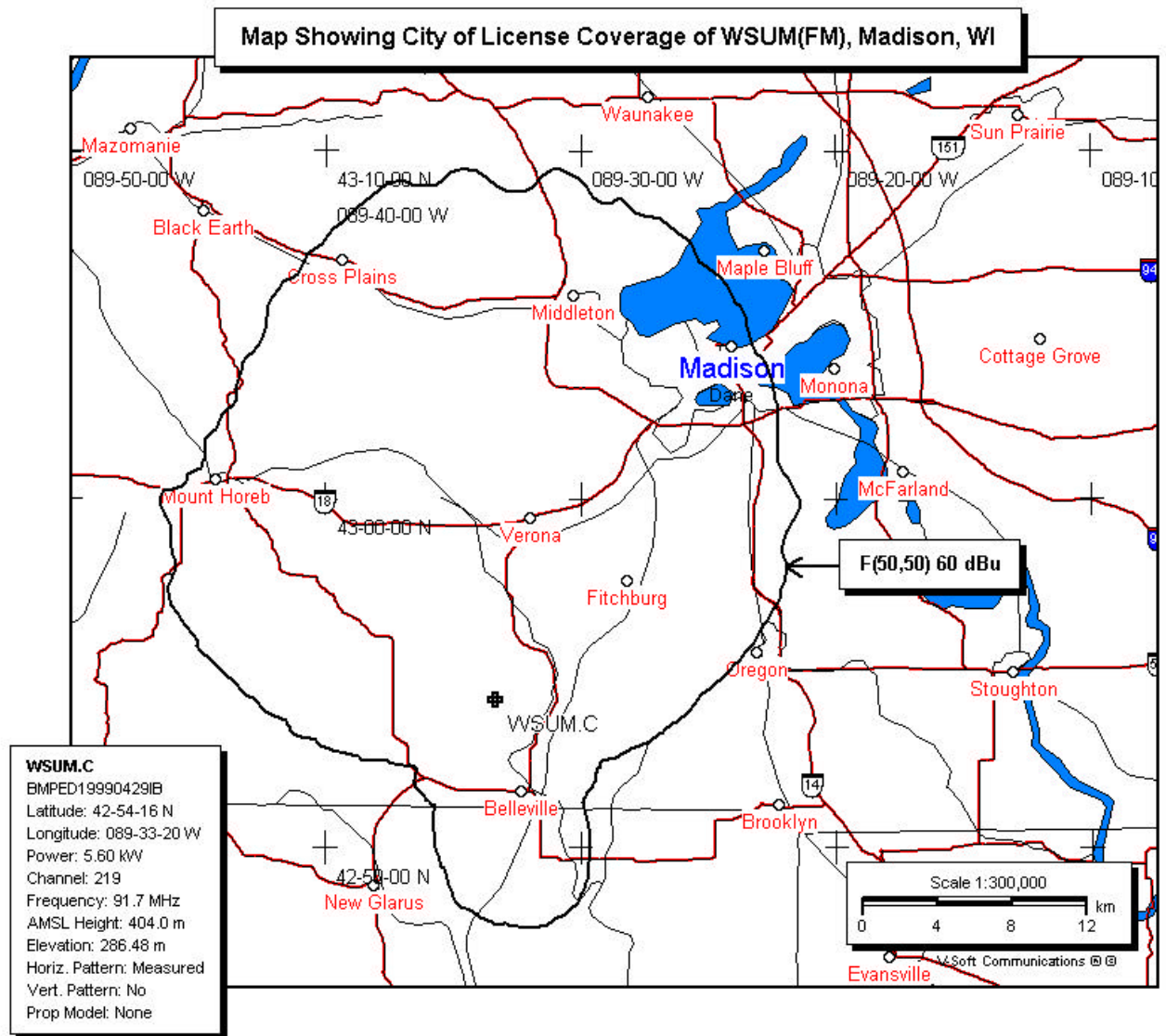
**Figure 1-B**



**Figure 2**

**WSUM Measured Composite Antenna Pattern  
 FM Channel 219A  
 Madison, Wisconsin**

<b>Azimuth (°T)</b>	<b>Relative Field</b>	<b>Limit</b>		<b>Azimuth (° T)</b>	<b>Relative Field</b>	<b>Limit</b>
0	1.000	1.000		180	.160	.254
10	.970	1.000		190	.130	.262
20	.905	1.000		200	.090	.262
30	.810	.841		210	.050	.262
40	.665	.668		220	.050	.262
50	.530	.531		230	.040	.262
60	.420	.422		240	.060	.262
70	.330	.335		250	.100	.262
80	.220	.266		260	.160	.262
90	.150	.211		270	.220	.290
100	.100	.200		280	.300	.330
110	.070	.200		290	.390	.396
120	.050	.200		300	.497	.498
130	.050	.200		310	.600	.628
140	.050	.200		320	.720	.790
150	.090	.207		330	.840	.995
160	.130	.224		340	.920	1.000
170	.160	.243		350	.980	1.000



**Figure 3**