

Columbia FM, Inc.  
FM Translator W234BH – Facility ID 141502  
Exhibit 11G – WQKX Interference Protection Calculation  
December 2008

Columbia FM, Inc. proposes relocation of its FM Translator W234BH, Berwick, PA to the existing WHLM-FM tower at NAD27 coordinates 41° 05' 11" N, 76° 16' 41" W. This site is 48.5 kilometers northeast of third-adjacent station WQKX, Channel 234B in Sunbury, PA and falls within the predicted 54 dBu service contour of WQKX, as shown in Exhibit 11A.

The predicted F(50,50) field strength of WQKX at the proposed site is slightly greater than 61.0 dBu, as shown in Exhibits 11A and 11B. Based on the accepted +40 dB U/D ratio for third-adjacent facilities, the pertinent interference contour of the translator is 101 dBu. Assuming an effective radiated power of 15 watts with no antenna directivity, the free-space radius of this contour would be 242 meters.

Exhibit 11C is a copy of the most recent USGS Mifflinville, PA 7.5 minute topographic quadrangle map with proposed translator site plotted near the right edge. Exhibit 11D is an enlarged portion of this map showing two minor roads intersecting near the site and three houses close enough to warrant further study. The translator's predicted 101 dBu free-space contour clears each of these populated structures, as discussed below.

W234BH will employ a Kathrein/Scala CA-2V vertically-polarized directional transmit antenna mounted 38 meters above ground level and 364 meters above mean sea level on the WHLM-FM tower, with the main radiation lobe centered at 150 degrees with respect to True North. An azimuth pattern for this antenna is provided in Exhibit 11E, and an elevation pattern is submitted as Exhibit 11F.

House #1 is 100 meters distant at an azimuth of 50 degrees, which is 100 degrees counter-clockwise from the center of main radiation lobe. The relative field at this bearing is specified as 0.020, corresponding to a power ratio of 0.0004. Multiplied by maximum ERP of 15 watts, the power directed at this bearing would be 0.006 watts. Using the FCC Audio Division "FM Propagation Curves" online calculator (which accepts only power values of at least 1 watt), it is shown that the 101 dBu contour would not extend more than 63 meters from the antenna; therefore, House #1 is protected against interference to WQKX.

House #2 is 140 meters from the site at a bearing of 92 degrees, or 58 degrees off center of the main radiation lobe. The specified relative field in this direction is 0.452; therefore, the power ratio is 0.2043 and ERP is 3.1 watts. The calculated free-space 101 dBu contour extends only 110 meters at this bearing, so this house is also protected.

House #3 is the most distant populated structure, located 190 meters south of the site at a 190 degree bearing, 40 degrees clockwise from the center of the main lobe. According to the USGS topo map, ground elevation at this point is approximately 317 meters AMSL. A depression angle of -11 degrees was assumed from the proposed translator's antenna to a rooftop receive antenna atop this house at 9 meters AGL, therefore the relative field should be adjusted by a factor of 0.974. The azimuth pattern indicates a relative field of 0.735 at this bearing in the horizontal plane, but if multiplied by the elevation pattern, the field decreases to 0.716, corresponding to a power ratio of 0.513 or 7.7 watts ERP. The free space contour would extend only 173 meters towards this house, so it too is outside the zone where the 40 dB ratio is exceeded.

Applicant thereby believes that this proposal complies with 47 CFR 74.1204(d) and FCC policy as set forth in the "Living Way Ministries, Inc." decision [17 FCC Rcd 17054, 17056 (2002)].