ENGINEERING REPORT
FM SPECTRUM ANALYSIS

WKFR-FM 103.3 MHz, Battle Creek, MI

WCFG-FM 90.9 MHz, Springfield, MI

August 2011

MUNN–REESE, INC.
Broadcast Engineering Consultants
Coldwater, MI 49036

EXHIBIT B
APPLICATION FOR STATION LICENSE
CUMULUS LICENING LLC
WKFR-FM AUXILIARY FM ANTENNA
WKFR-FM RADIO STATION
CH 277B - 103.3 MHZ - 3.4 KW
BATTLE CREEK, MICHIGAN
August 2011

COMPLIANCE WITH §73.317
WKFR-FM and WCFG-FM

This firm was retained by Cumulus Licensing LLC to perform the required measurements to show compliance with the provisions of §73.317 of the Rules governing FM Broadcast Stations. WKFR-FM and WCFG-FM has installed a di-plexer for operation in to a common antenna. These measurements were made to confirm proper operation of the two station combiner and FM broadcast antenna.

Measurements were taken off air to show compliance with the combined operation of the two stations located on the tower. The occupied spectrum measurements were made using a properly calibrated and operated spectrum analyzer. That plotted data is found at the end of this report.

Inter-modulation products were calculated using a computer program to list all possible frequencies that may have developed with the combined WKFR-FM / WCFG-FM operation. The computer generated print out of possible mixing products was then used to set the FM field meter frequency dial before the individual measurements were recorded.

The Inter-modulation products were measured using a Potomac Instruments Model FIM-71 Field Strength Meter and an Anritsu MS2721B Spectrum Master. The measurements were made August 12, 2011. The measurements were taken in an unobstructed location within 1 km of the transmitting antennas. The meter was setup and calibrated in accordance with the manufacturer's instructions, and the readings taken on the fundamental carrier frequencies and on suggested inter-modulation frequencies.

The readings were logged. The appropriate antenna factor was determined from the chart in the manual for the meter, and the reading on each frequency was then noted and logged. That logged data was then used to construct Table 1 of this report.

Equipment employed:

Anritsu MS2721B Spectrum Master. Technical specifications of the Anritsu MS2721B are available on the Internet at www.anritsu.com.

Potomac Instruments FIM-71, Field Meter, Serial No. 533. Technical specifications of the FIM-41 field intensity meter are available at www.pi-usa.com.

Based on these spectrum measurements and the data logged in Table 1 the operation of WKFR-FM and WCFG-FM is well within the rules set forth in §73.317 of the Rules governing FM Broadcast Stations.

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TABLE 1

Tabluation of Intermod Frequencies with WKR-FM and WCFG-FM

Call Sign		Frequency	Fundamental Field	ERP Watts	Required Attenuation 80.00 dB
WCFG-FM	A	90.9 MHz	128.00 mV/m	700.0	71.50 dB.
WKFR-FM	B	103.3 MHz	810.00 mV/m	50,000	80.00 dB.

Relationship	IM Frequency	Mix Field	Attenuation	Reference Freq	Flag
2A	181.8 MHz	2.2 µV/m	95.30 dB.	A	Passed
2B	206.6 MHz	1.3 µV/m	99.87 dB.	B	Passed
A + B	194.20 MHz	1.1 µV/m	101.32 dB.	B	Passed
2A - B	78.50 MHz	1.2 µV/m	100.56 dB.	A	Passed
2B - A	115.70 MHz	4.3 µV/m	89.47 dB.	B	Passed

CERTIFICATION OF ENGINEERS

The firm of Munn-Reese, Inc., Broadcast Engineering Consultants, with offices at 385 Airport Drive, Coldwater, Michigan, has been retained for the purpose of preparing the technical data forming this report.

The data utilized in this report is based on field measurements or observations made by the undersigned, or others under the supervision of the undersigned, on the dates and times indicated in the report.

The report has been prepared by properly trained electronics specialists under the direction of the undersigned whose qualifications are a matter of record before the Federal Communications Commission.

I declare under penalty of laws of perjury that the contents of this report are true and accurate to the best of my knowledge and belief.

August 12, 2011

By _____
Wayne S. Reese, President

By _____
Edmond R. Trombley, Project Engineer

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