

# **ENGINEERING REPORT**

## **MINOR CONSTRUCTION PERMIT APPLICATION**

For the NCE-FM Facilities of

**WKKM(FM) – Harrison, MI  
CH214A – 90.7 MHz  
Facility ID No. 174240**

License Number  
**BLED-20110718AAF**

January, 2012

COPYRIGHT 2012

# **TABLE OF CONTENTS**

---

Discussion of Report

## **Main Studio Location**

- Exhibit 15.1 - Copy of USGS Topographic Map of Existing Site
- Exhibit 15.2 - Copy of USGS Photograph of Existing Site
- Exhibit 15.3 - Vertical Plan of Antenna System and Support Tower
- Exhibit 15.4 - Tabulation of Operating Conditions
- Exhibit 15.5 - Present & Proposed Contour Study

## **Interference Requirements**

### **Contour Overlap Requirements**

- Exhibit 18.1 - Tabulation of Non-Commercial Allocation
- Exhibit 18.2 - Contour Protection Toward WKAR(FM) – East Lansing, MI
- Exhibit 18.3 - Contour Protection Toward WMSD.C – Rose Twp., MI
- Exhibit 18.4 - Contour Protection Toward WTRK(FM) – Freeland, MI
- Exhibit 18.5 - Contour Protection Toward WQAC(FM) – Alma, MI
- Exhibit 18.6 - Contour Protection Toward WPHN(FM) – Gaylord, MI
- Exhibit 18.7 - Tabulation of Proposed Directional Antenna Pattern

**Spacing Requirements** (none)

**Grandfathered Short-Spaced Requirements** (none)

**Contour Protection Requirements** (none)

**TV Channel 6 Protection Requirements** (See Discussion)

### **RF Radiation Study Requirement**

- Exhibit 24.1 - RF Compliance Study

(Exhibit Numbering is in response to FCC Online Form 340, Section VII)

## Discussion of Report

---

This firm was retained to prepare the required engineering report in support of this minor construction permit application for NCE-FM station WKKM(FM) - Harrison, MI, License No. BLED-20110718AAF. WKKM(FM) is licensed to operate on CH214A (90.7 MHz) with Class A operating parameters of 0.100 kW at a COR of 366 meters AMSL. This minor modification application specifies Class C3 operating parameters of 10.0 kW at a COR of 382 meters AMSL from a new site location. The station will continue to serve the community of Harrison, MI.

The proposed site for the Class C3 operation meets all §73.509 contour protection requirements towards other domestic stations in the allocation. A tabulation of the proposed protections to each of the other relevant stations is found in **Exhibit 18.1**. There are five (5) other facilities, WKAR-FM - East Lansing MI; WMSD.C - Rose Township MI; WTRK(FM) - Freeland MI; WQAC(FM) - Alma MI; and WPHN(FM) - Gaylord MI deemed close enough to require further study. An FMCommander™ map of the relevant protected and interference contours toward the relevant facilities has been supplied in **Exhibit(s) 18.2 to Exhibit(s) 18.6**. It is believed there is sufficient clearance to preclude the need for further study with respect to the other domestic protected stations shown in the allocation study. Tabulations for each contour employed will be supplied to the FCC upon request.

The transmitter site is located within 320 km of the common border between the United States and Canada. Full protection will be afforded all Canadian facilities over Canadian soil as noted in **Exhibit 18.1**. No given interference will result to any of the Canadian facilities over Canadian soil as noted in the allocation showing.

The Transmitter site is not located within the affected radius of any Channel 6 television facility; therefore no further TV-6 protection studies are required.

The proposed service contours have been calculated in accordance with the Rules, and the data obtained has been tabulated and plotted in this report. The plotted service contour is found as **Exhibit 15.5** of this report. This exhibit shows the overall service that is provided by the 1.0 mV/m contour of the facility. The tabulation of the distances to the respective contours shown in this discussion is based on the use of the standard eight cardinal bearings, which were also used for the computation of the HAAT. However, the plotted contours shown in **Exhibit 15.5** are based on the use of a full 360 terrain radials and the USGS 03 Second Terrain Database.

The antenna will be mounted on an existing 152.1 meter AGL tower bearing ASR number 1007817. While this proposal will not increase the overall tower height, due to an observed error in site coordinates, the FAA has been notified. Antenna Structure Registration will be corrected upon receipt of the revised FAA "Determination of No Hazard". A copy of USGS Topographic Mapping showing the existing site has been included in **Exhibit 15.1**. A vertical antenna plan depicting the placement of the antenna on the tower has been included in **Exhibit 15.3**.

## Discussion of Report (continued)

The remainder of the information in this report and exhibit numbering is responsive to the Rules of the Commission, and provides the data for FCC Form 340.

**RADIATION PROTECTION:** The Commission requires an engineering study regarding compliance with the guidelines for human protection from radiofrequency radiation. This report section is in response to that provision of the Rules. The current Federal Communications Commission guidelines for RF radiation protection are set forth in OET Bulletin No. 65 (Edition 97-01), and the accompanying Supplement A, (Edition 97-01).

The FM Broadcast facility proposed in this application will not produce human exposure to radiofrequency radiation in excess of the applicable safety standards specified in §1.1307(b)(3) of the Commission's rules concerning RF contributors of less than 5%. ***Exhibit 24.1*** provides the details of the study that was made to demonstrate compliance. The facility is or will be properly marked with signs, and entry is restricted by means of fencing with locked doors and/or gates if required. Any other means as may be required to protect employees and the general public will be employed.

***In the event work would be required in proximity to the antenna such that the person or persons working in the area would be potentially exposed to fields in excess of the guidelines set forth in OET Bulletin No. 65 (Edition 97-01), the transmitter power will be reduced or the station will cease operation during the critical period.***

**DISTANCES TO CONTOURS:** The table below shows the distances to the 1.0 mV/m contour from the proposed facility using an ERP of 10.0 kW at an HAAT of 130 meters. These distances have been calculated based on the FCC F(50-50) curves.

N. Lat. = 435717.0    W. Lng. = 843259.0						
HAAT and Distance to Contour,						
FCC, FM 2-10 Mi, 51 pts Method - USGS 03 SEC						
Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	270.8	111.2	7.9388	9.00	0.891	31.73
045	250.0	132.0	1.0956	0.40	0.331	21.77
090	233.2	148.8	3.3524	5.25	0.579	29.51
135	221.9	160.1	4.0704	6.10	0.638	32.05
180	229.7	152.3	10.0000	10.00	1.000	38.53
225	248.8	133.2	10.0000	10.00	1.000	36.24
270	279.2	102.8	10.0000	10.00	1.000	32.29
315	285.6	96.4	10.0000	10.00	1.000	31.27
Ave El= 252.39 M    HAAT= 129.61 M    AMSL= 382						