

**MINOR CHANGE APPLICATION**  
**MODIFICATION OF CONSTRUCTION PERMIT**  
**HINDLIN BROADCASTING, LLC**  
**W277DF FM TRANSLATOR STATION**  
**CH 277D - 103.3 MHZ - 0.25 KW DA**  
**NORFOLK, VIRGINIA**  
**November 2016**

**EXHIBIT C**

**Radio Frequency Radiation Study**

This radio frequency radiation study is being conducted to determine whether this proposal is in compliance with OET Bulletin #65, dated August 1997, regarding human exposure to radio frequency radiation in the vicinity of broadcast towers. This study utilizes the appropriate formulas contained in the OET Bulletin.<sup>1</sup>

The proposed W277DF antenna will be mounted with its center of radiation 118.3 meters (388 feet) above the ground at the tower location and will operate with an effective radiated power of 0.25 kilowatt in the vertical and horizontal planes (circularly polarized). At 2.0 meters above the ground at the base on the tower, the W277DF antenna will contribute 0.00072 mw/cm<sup>2</sup>.<sup>2</sup> Based on exposure limitations for a controlled environment, less than 0.1% of the allowable limit is reached at 2.0 meters above the ground at the base of the tower. For uncontrolled environments, 0.36% of the ANSI limit is reached at 2.0 meters above the ground at the tower base.

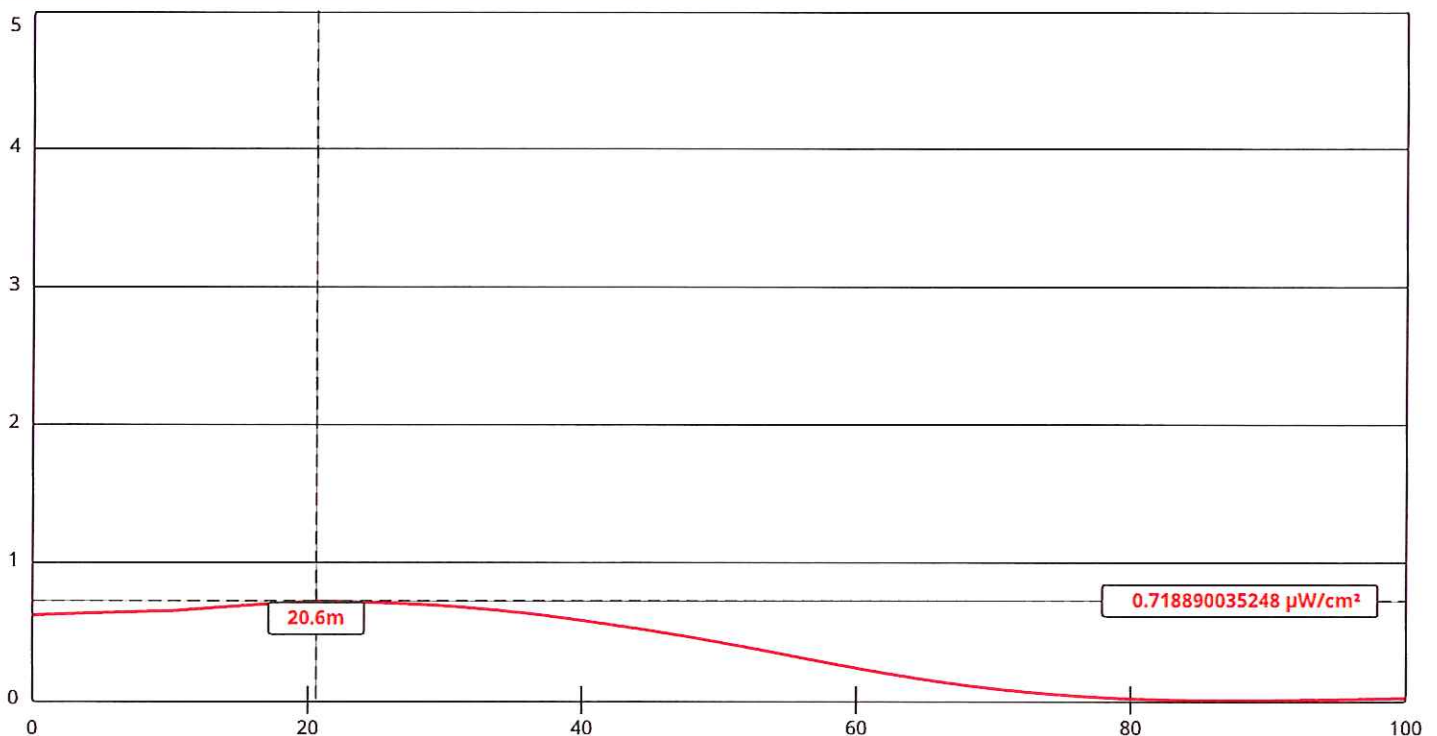
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- 1) The FCC Program FM Model is used to predict the contribution. Unless otherwise noted a single bay Type I antenna is used in this prediction.
  - 2) This level of signal is delivered 20.6 meters from the base of the tower and is considered a worst case scenario.

Since this level for uncontrolled environments is below the 5.0% limit defined by the Commission in §1.1307(b)(3)(i) of the Commission's rules, the proposed W277DF facility is believed to be in compliance with the radio frequency radiation exposure limits as is required by the Federal Communications Commission. Further, HBL will post warning signs in the vicinity of the tower and at the gated access point warning of potential radio frequency radiation hazards at the site. In addition, HBL will reduce the power of the proposed facility or cease operation, in cooperation and coordination with other tower users, as necessary, to protect persons having access to the site, tower or antenna from radio frequency radiation in excess of FCC guidelines.

# FM Model

**EXHIBIT C1**  
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The FM Model calculator determines the potential exposure from radiofrequency (RF) electromagnetic fields produced by FM broadcast station antennas at ground level. The FM Model software was originally developed by the FCC in 1997 as a standalone executable program and this improved version provides more precise predictions and runs via a JavaScript enabled web browser. The FM Model is originally based on measured data [published in 1985 by the EPA](http://nepis.epa.gov/Exe/ZyNET.exe/2000ED2W.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1981+Thru+1985&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A\zyfiles\Index%20Data\81thru85\Tst\00000003\2000ED2W.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h|-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p|f&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL) (<http://nepis.epa.gov/Exe/ZyNET.exe/2000ED2W.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1981+Thru+1985&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A\zyfiles\Index%20Data\81thru85\Tst\00000003\2000ED2W.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h|-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=p|f&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>). [Show More....](#)



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Channel Selection	Channel 277 (103.3 MHz) ▼		
<a href="#">Antenna Type +</a>	EPA Type 1: Ring-and-Stub or "Other" ▼		
Height (m)	<input type="text" value="118.3"/>	Distance (m)	<input type="text" value="100"/>
ERP-H (W)	<input type="text" value="250"/>	ERP-V (W)	<input type="text" value="250"/>
Num of Elements	<input type="text" value="5"/>	Element Spacing (λ)	<input type="text" value="1"/>
Num of Points	<input type="text" value="500"/>	<a href="#">Apply</a>	