

# **ENGINEERING EXHIBIT**

## **Application for Construction Permit**

prepared for

**Board Of Trustees Of The University Of Arkansas**

KUAR(FM) Little Rock, Arkansas

Ch. 206C1 56 kW 342 m

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FCC Form 340, Section VII-FM Engineering

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#### **Exhibit 22**

Statement B	Environmental Considerations
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*This material supplies a "hard copy" of the engineering portions of this application as entered May 29, 2009 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.*

**Section VII Preparer's Certification**

I certify that I have prepared Section VII (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name ROBERT J. CLINTON		Relationship to Applicant (e.g., Consulting Engineer) CONSULTANT	
Signature		Date 5/29/2009	
Mailing Address CAVELL, MERTZ & ASSOCIATES, INC. 7839 ASHTON AVENUE			
City MANASSAS	State or Country (if foreign address) VA		Zip Code 20109-2883
Telephone Number (include area code) 7033929090		E-Mail Address (if available) BCLINTON@CAVELLMERTZ.COM	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

**Section VII - FM Engineering****TECHNICAL SPECIFICATIONS**

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

**TECH BOX**

1.	Channel Number: 206		
2.	Class (select one): <input type="radio"/> D <input type="radio"/> A <input type="radio"/> B1 <input type="radio"/> B <input type="radio"/> C3 <input type="radio"/> C2 <input checked="" type="radio"/> C1 <input type="radio"/> C0 <input type="radio"/> C		
3.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 34 Minutes 47 Seconds 49 <input checked="" type="radio"/> North <input type="radio"/> South  Longitude: Degrees 92 Minutes 29 Seconds 20 <input checked="" type="radio"/> West <input type="radio"/> East		
4.	Proposed Assignment Coordinates: (NAD 27) - RESERVED CHANNELS ABOVE 220 ONLY <input checked="" type="checkbox"/> Not Applicable Latitude: Degrees Minutes Seconds <input type="radio"/> North <input type="radio"/> South  Longitude: Degrees Minutes Seconds <input type="radio"/> West <input type="radio"/> East		
5.	Antenna Structure Registration Number: 1263739 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA		
6.	Overall Tower Height Above Ground Level:	370.0 meters	
7.	Height of Radiation Center Above Mean Sea Level:	466.8 meters(H) 466.8 meters(V)	
8.	Height of Radiation Center Above Ground Level:	186.4 meters(H) 186.4 meters(V)	
9.	Height of Radiation Center Above Average Terrain:	342 meters(H) 342 meters(V)	
10.	Effective Radiated Power:	56 kW(H) 56 kW(V)	
11.	Maximum Effective Radiated Power: (Beam-Tilt Antenna ONLY)	<input checked="" type="checkbox"/> Not Applicable	kW(H) kW(V)
12.	Directional Antenna Relative Field Values: <input checked="" type="checkbox"/> Not applicable (Nondirectional)		

Rotation (Degrees): <input type="checkbox"/> No Rotation											
Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0		10		20		30		40		50	
60		70		80		90		100		110	
120		130		140		150		160		170	
180		190		200		210		220		230	
240		250		260		270		280		290	
300		310		320		330		340		350	
Additional Azimuths											

[Relative Field Polar Plot](#)

<b>NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.</b>																					
<b>CERTIFICATION</b>																					
<b>AUXILIARY ANTENNA APPLICANTS ARE NOT REQUIRED TO RESPOND TO ITEMS 13-17. PROCEED TO ITEM 18.</b>																					
13.	<b>Main Studio Location.</b> The proposed main studio location complies with 47 C.F.R. Section 73.1125. <input checked="" type="radio"/> Yes <input type="radio"/> No <div align="right">See Explanation in [Exhibit 13]</div>																				
14.	<b>Community Coverage.</b> The proposed facility complies with 47 C.F.R. Section 73.315. (Channels 221 and above) or 47 C.F.R. Section 73.515 (Channels 220 and below). <input checked="" type="radio"/> Yes <input type="radio"/> No <div align="right">See Explanation in [Exhibit 14]</div>																				
15.	<b>Interference.</b> The proposed facility complies with all of the following applicable rule sections. Check all that apply: <input checked="" type="radio"/> Yes <input type="radio"/> No <div align="right">See Explanation in [Exhibit 15]</div> <table border="1"> <tr> <td colspan="2"><b>Contour Overlap Requirements.</b></td> </tr> <tr> <td>a. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.509</td> <td>[Exhibit 16]</td> </tr> <tr> <td colspan="2"><b>Spacing Requirements.</b></td> </tr> <tr> <td>b. <input type="checkbox"/> 47 C.F.R. Section 73.207 with respect to station(s)</td> <td></td> </tr> <tr> <td colspan="2"><b>Grandfathered Short-Spaced.</b></td> </tr> <tr> <td>c. <input type="checkbox"/> 47 C.F.R. Section 73.213(a) with respect to station(s)</td> <td>[Exhibit 17]</td> </tr> <tr> <td colspan="2"><b>Contour Protection.</b></td> </tr> <tr> <td>d. <input type="checkbox"/> 47 C.F.R. Section 73.215(a) with respect to station(s)</td> <td>[Exhibit 18]</td> </tr> <tr> <td colspan="2"><b>Television Channel 6 Protection.</b></td> </tr> <tr> <td>e. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.525 with respect to station(s)</td> <td>[Exhibit 19]</td> </tr> </table>	<b>Contour Overlap Requirements.</b>		a. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.509	[Exhibit 16]	<b>Spacing Requirements.</b>		b. <input type="checkbox"/> 47 C.F.R. Section 73.207 with respect to station(s)		<b>Grandfathered Short-Spaced.</b>		c. <input type="checkbox"/> 47 C.F.R. Section 73.213(a) with respect to station(s)	[Exhibit 17]	<b>Contour Protection.</b>		d. <input type="checkbox"/> 47 C.F.R. Section 73.215(a) with respect to station(s)	[Exhibit 18]	<b>Television Channel 6 Protection.</b>		e. <input checked="" type="checkbox"/> 47 C.F.R. Section 73.525 with respect to station(s)	[Exhibit 19]
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16.	<b>Reserved Channels Above 220.</b> a. <b>Availability of Channels.</b> The proposed facility complies with the assignment requirements of 47 C.F.R. Section 73.203. <input type="radio"/> Yes <input type="radio"/> No <div align="right">See Explanation in [Exhibit 20]</div>																				
17.	<b>International Borders.</b> The proposed antenna location is not within 320 kilometers of the common border between the United States and Canada or Mexico. <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Canada <input type="radio"/> Mexico <div align="right">[Exhibit 21]</div> <p>If "No," specify the country and provide an exhibit of compliance with all provisions of the relevant International Agreement.</p>																				

18.	<b>Environmental Protection Act.</b> The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine compliance through the use of the RF worksheets in Worksheet #7, an <b>Exhibit is required.</b>  By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.	<input checked="" type="radio"/> Yes <input type="radio"/> No  See Explanation in [Exhibit 22]
19.	<b>Community of License Change - Section 307(b).</b> If the application is being submitted to change the facility's community of license, then the applicant certifies that it has attached an exhibit containing information demonstrating that the proposed community of license change comports with the fair distribution of service policies underlying Section 307(b) of the Communications Act of 1934, as amended (47 U.S.C. Section 307(b)).  An exhibit is required unless this question is not applicable.	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> N/A  [Exhibit 23]
<b>PREPARER'S CERTIFICATION ON PAGE 8 MUST BE COMPLETED AND SIGNED.</b>		

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## Exhibits

### Exhibit 14

**Description:** EXHIBIT 14 - COMMUNITY COVERAGE

SEE EXHIBIT 15 - STATEMENT A FOR COMMUNITY COVERAGE DISCUSSION.

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### Attachment 14

### Exhibit 15

**Description:** EXHIBIT 15 - STATEMENT A

EXHIBIT 15 - STATEMENT A - NATURE OF THE PROPOSAL AND ALLOCATION CONSIDERATIONS

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### Attachment 15

Description
<a href="#">EXHIBIT 15 - STATEMENT A</a>

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### Exhibit 16

**Description:** EXHIBIT 16 - CONTOUR PROTECTION

SEE EXHIBIT 15 - STATEMENT A FOR CONTOUR PROTECTION DISCUSSION.

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### Attachment 16

### Exhibit 19

**Description:** EXHIBIT 19 - CHANNEL 6 PROTECTION

SEE EXHIBIT 15 - STATEMENT A FOR CHANNEL 6 PROTECTION DISCUSSION. THE REFERENCED CHANNEL 6 LETTER IS ATTACHED AS ATTACHMENT 1.

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### Attachment 19

Description
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Description
<a href="#">EXHIBIT 19 - Attachment 1</a>

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**Exhibit 22****Description:** EXHIBIT 22 - STATEMENT B

EXHIBIT 22 - STATEMENT B - ENVIRONMENTAL CONSIDERATIONS (WITH TABLE OF CONTENTS AND COPY OF FORM 340, SECTION VII - FM ENGINEERING)

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**Attachment 22**

Description
<a href="#">EXHIBIT 22 - STATEMENT B</a>

Exhibit 22 - Statement B  
**ENVIRONMENTAL CONSIDERATIONS**  
prepared for  
**Board Of Trustees Of The University Of Arkansas**  
KUAR(FM) Little Rock, Arkansas  
Facility ID 4296  
Ch. 206C1 56 kW 342 m

**Nature of The Proposal**

*Board Of Trustees Of The University Of Arkansas* (“*University*”) seeks authorization to construct a transmitter facility at a new location. The proposed operation will employ a nondirectional FM antenna system to be sidemounted on an existing tower structure (ASR number 1263739). The instant proposal is not believed to have a significant environmental impact as defined under Section 1.1306 of the Commission’s Rules. Consequently, preparation of an Environmental Assessment is not required.

The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. Since the proposal involves an existing tower structure and no change in height is required to accommodate the instant proposal, this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission’s rules.

**Human Exposure to RF Electromagnetic Field**

The proposed operation at this site was evaluated for human exposure to radiofrequency electromagnetic field using the procedures outlined in the Commission’s OET Bulletin No. 65 (“OET-65”). OET-65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with the limits specified in §1.1310 if it satisfies the exposure criteria set forth in OET-65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with those guidelines.

The proposed facility will operate with an ERP of 56 kW with the antenna center of radiation 186.4 meters above ground level. It will utilize an ERI model SHPX-12AC 12 bay,

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**ENVIRONMENTAL CONSIDERATIONS**  
(page 2 of 3)

full-wave spaced, circularly polarized, omni-directional antenna. According to data provided by the antenna manufacturer, the maximum relative field value in nearby downward directions (between 15 and 90 degrees below the horizontal) is less than 30 percent. Thus, a value of 30 percent relative field is used for this calculation. The “uncontrolled/general population” limit specified in §1.1310 for the FM Band is 200  $\mu\text{W}/\text{cm}^2$ .

The formula used for calculating FM signal density in this analysis is essentially the same as equation (9) in OET-65.

$$S = (33.4098) (F^2) (ERP) / D^2$$

Where:

S = power density in microwatts/cm<sup>2</sup>  
F = relative field factor  
ERP = total (average) ERP in Watts  
D = distance in meters

Using this formula and the assumptions provided above, the proposed facility would contribute a maximum power density of 9.9  $\mu\text{W}/\text{cm}^2$ , or 4.95 percent of the “uncontrolled/general population” limit, at locations two meters above ground level. At ground level locations away from the base of the tower, the calculated RF power density is even lower, due to the increasing distance from the transmitting antenna.

§1.1307(b)(3) states that facilities are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of any other facilities near this site may be considered independently from this facility. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

### **Safety of Workers and the General Public**

As demonstrated herein, excessive levels of RF electromagnetic field attributable to the proposal will not be caused at publicly accessible areas at ground level near the antenna

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**ENVIRONMENTAL CONSIDERATIONS**  
(page 3 of 3)

supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower access will be restricted and controlled through the use of a locked fence. Additionally, appropriate RF exposure warning signs will be posted.

With respect to worker safety, a site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed in the vicinity of or on the tower. Such protective measures may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines will be exceeded. On-site RF exposure measurements may also be undertaken to more specifically establish the bounds of safe working areas. The applicant will coordinate RF protective measures with other site users.

**Conclusion**

Based on the preceding, it is believed that the instant proposal complies with the RF exposure provisions of §1.1306 of the Rules.