

## **ENGINEERING EXHIBIT**

### **Application for Modification of Digital Low Power Television Construction Permit**

prepared for

**EICB-TV East, LLC**  
K20MB-D Sioux Falls, SD  
Facility ID 182599  
Ch. 20 (digital) 15 kW

*EICB-TV East, LLC* (“*EICB*”) is the permittee of digital Low Power Television station K20MB-D, Channel 20, Sioux Falls, SD, Facility ID 182599. K20MB-D is authorized to operate pursuant to a Construction Permit (“CP”, BNPDTL-20090825AXW) with 15 kW effective radiated power (“ERP”), nondirectional. *EICB* herein seeks a modification of the CP to utilize an alternate transmitting location.

As proposed herein, K20MB-D will be relocated to a tower structure associated with FCC Antenna Structure Registration number 1035413, 12.7 km from the authorized K20MD-D site. K20MD-D will utilize an existing transmitting top-mounted antenna which was previously employed by full service stations during the transition to digital. No change to the overall structure height will result from this proposal. The site is located more than 121 kilometers (75 miles) from the reference coordinates of the cities listed in Appendix A of DA 09-1487.<sup>1</sup>

The proposed K20MD-D facility will operate with a nondirectional antenna at 15 kW ERP using a “full service” out of channel emission mask. Figure 1 depicts the coverage contour of the proposed facility as well as that of the CP facility. The service area overlap demonstrates compliance with §73.3572 for a minor change.

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<sup>1</sup>“Commencement of Rural, First-come, First-served digital licensing for Low Power Television and TV Translators Beginning August 25, 2009 and Commencement of Nationwide, First-come, First-served Digital Licensing for Low Power Television and TV Translator Services Beginning January 25, 2010,” Public Notice, DA 09-1487, Released June 29, 2009.

Interference study per OET Bulletin 69<sup>2</sup> shows that the proposal complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations. The results, summarized in Table 1, show that any new interference does not exceed the FCC's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations) to any facility.

The nearest FCC monitoring station is 328 km distant at Grand Island, NE. This exceeds by a large margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The site is not located within the areas requiring coordination with "quiet" zones specified in §73.1030(a) and (b). The site is not within a border area requiring international coordination. There are no authorized AM radio stations within 3 km of the proposed site.

### **Human Exposure to Radiofrequency Electromagnetic Field**

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the Commission's OET Bulletin Number 65. Based on OET-65 equation (10), and assuming the worst-case of 100 percent field in downward elevations, the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is  $1.5 \mu\text{W}/\text{cm}^2$ , which is 0.5 percent of the general population/uncontrolled maximum permitted exposure limit. This is below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent. The calculated signal density will be even lower when the antenna's elevation pattern is considered.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will be posted. With respect to worker safety, the

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<sup>2</sup>FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). The implementation of OET-69 for this study followed the guidelines of OET-69 as specified therein. The default cell size of 1 km was employed. Comparisons of various results of this computer program (run on a Sun Sparc processor) to the Commission's implementation of OET-69 show excellent correlation.

applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from RF electromagnetic field exposure in excess of FCC guidelines.

Environmental matters covered by this exhibit are limited to the evaluation of exposure to RF electromagnetic field. The proposal involves use of an existing transmitting antenna. No change in structure height is proposed.

List of Attachments

Figure 1	Coverage Contour Comparison
Table 1	Interference Analysis Results Summary
Form 2100	Saved Version of Engineering Sections from FCC Form at Time of Upload

**Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E.	July 13, 2015	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

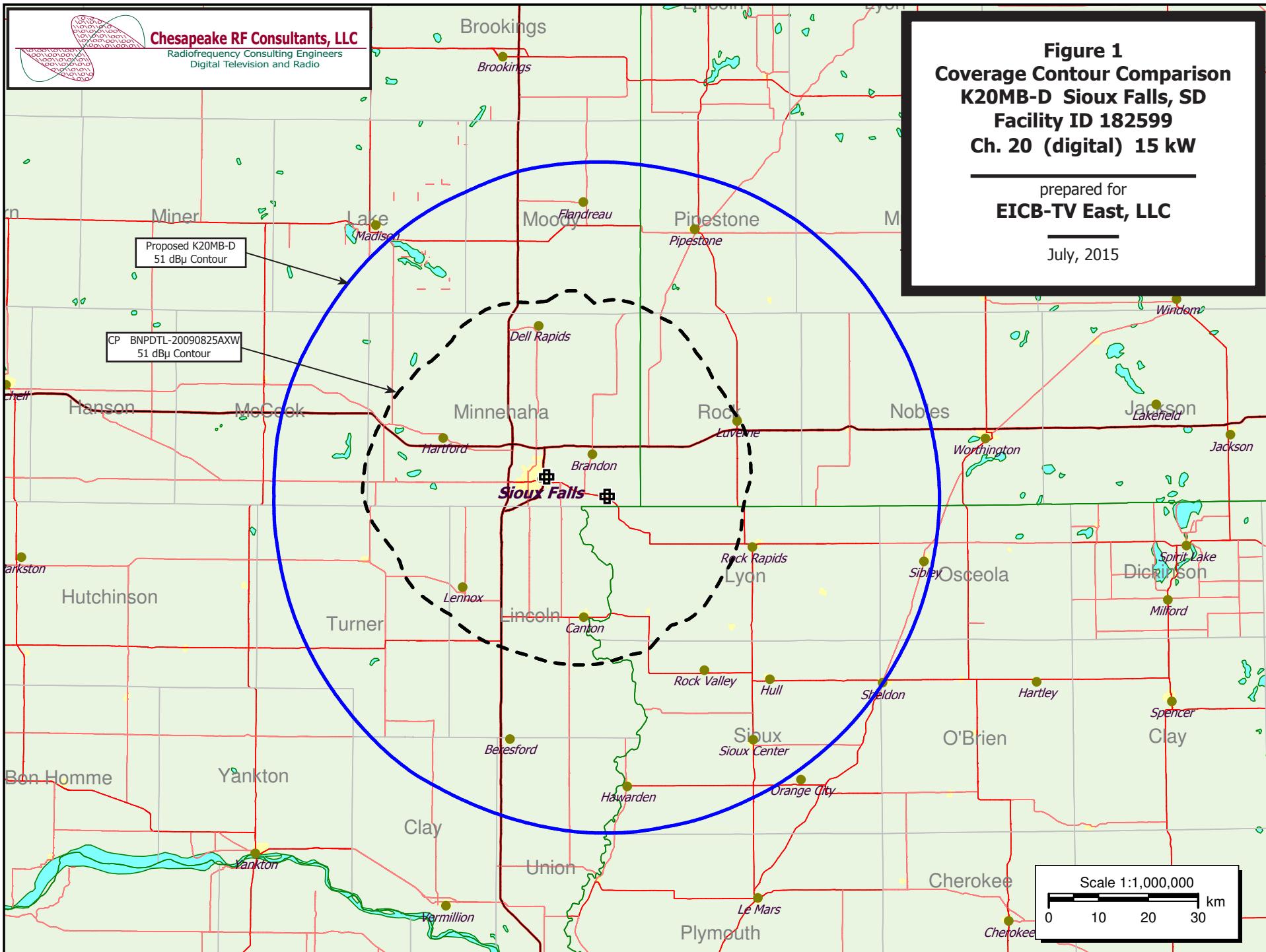
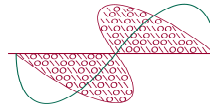


Table 1

**Interference Analysis Results Summary**

prepared for

**EICB-TV East, LLC****K20MB-D Sioux Falls, SD****Chesapeake RF Consultants, LLC**Radiofrequency Consulting Engineers  
Digital Television and Radio

K20MB-D USERRECORD-01                      SIOUX FALLS                      SD US  
 Channel 20 ERP 15.      kW      HAAT 589. m      RCAMSL 01019 m FULL SERVICE MASK  
 Latitude 043-31-07      Longitude 0096-32-04  
 Nondirectional antenna

The LMS application requires NAD-83 coordinates. FCC internal systems then convert to NAD-27 and port over to CDBS for processing. This interference analysis utilizes truncated NAD-27 coordinates to replicate FCC processing.

Ch.	Call	City/State	Dist	Status	Application Ref. No.	---Population (2000 Census)---	
			(km)			Baseline	New Interference
19	K19HZ-D	JACKSON MN	124.5	LIC	BLDTT-20090910AAS	---	none
19	K19CV-D	REDWOOD FALLS MN	169.8	LIC	BLDTT-20120604AAX	---	none
19	KXNE-TV	NORFOLK NE	154.7	LIC	BLEDT-20090615ADS	---	none
19	K19KJ-D	PLANKINTON SD	155.1	CP	BNPDTL-20100510AJE	---	none
19	K19KH-D	WATERTOWN SD	157.3	CP	BNPDTL-20100505AEC	---	none
20	K20LR-D	ASHBY MN	288.0	CP	BNPDTL-20100505AKR	---	none
20	KSMQ-TV	AUSTIN MN	323.0	LIC	BLEDT-20081223AAK	---	none
20	K20LV-D	BREWSTER MN	91.2	CP	BNPDTL-20100510AJH	18,519	218 (1.18%)
20	K20JY-D	OLIVIA MN	191.2	LIC	BLDTT-20120213ABM	---	none
20	K20KW-D	SAINT CLOUD MN	280.3	CP	BNPDTL-20100216AEA	---	none
20	K20LP-D	ST. JAMES MN	168.5	LIC	BLDTL-20120625AAR	---	none
20	NEW	CASSELTON ND	381.1	APP	BNPDTL-20100505ALC	---	none
20	KJRE	ELLENDAL ND	359.4	LIC	BLEDT-20041109AAB	---	none
20	KETV	OMAHA NE	249.1	LIC	BLCDT-20041222AED	1,221,841	322 (0.03%)
20	K20MA-D	KADOKA SD	378.5	CP	BNPDTL-20100510AHU	---	none
20	K20KZ-D	WATERTOWN SD	157.3	CP	BNPDTL-20100505ADZ	---	none
20	W20DU-D	EAU CLAIRE WI	393.9	CP	BLANK-0000002180	---	none
21	KBVK-LP	SPENCER IA	129.2	LIC	BLDTL-20130327AAK	---	none
21	K21LF-D	GRANITE FALLS MN	161.9	LIC	BLDTL-20110824ACJ	---	none
21	K21DG-D	ST. JAMES MN	168.7	LIC	BLDTL-20091204ADE	---	none
21	K21HS	NORFOLK NE	178.4	APP	BSTA-20121029AAH	---	none
21	K21HS	NORFOLK NE	178.5	LIC	BLTT-20060510AAY	---	none
21	K21LK-D	WENTWORTH SD	56.6	CP	BNPDTL-20100505AEK	---	none

## Antenna Structure Registration

\*Do you have an FCC Antenna Structure Registration (ASR) Number?

☒ Yes ☐ No << Clear

ASR Number:

Lookup ASR Number

(<http://wireless2.fcc.gov/UlsApp>

[/AsrSearch/asrRegistrationSearch.jsp](#))

## Coordinates (NAD83 (North American Datum of 1983))

Coordinates for each Site must be unique.

* Latitude (NAD83):	DD 43	MM 31	SS.S 7.0	Direction N+
* Longitude (NAD83):	DDD 96	MM 32	SS.S 6.0	Direction W-
* Structure Type:	TOWER-A free standing or guyed struct			
* Overall Structure Height:	605.0		meters	
* Support Structure Height:	581.0		meters	
* Ground Elevation (AMSL (Above Mean Sea Level)):	444.8		meters	

## Antenna Data

* Height of Radiation Center Above Ground Level:	574	meters
* Height of Radiation Center Above Mean Sea Level:	1018.80	meters
* Effective Radiated Power:	15	kW

Antenna Type

\* Please select an antenna type:

- ☐ Directional Custom
- ☒ Non-Directional
- ☐ Off the Shelf

Antenna Manufacturer and Model

\* Manufacturer:

\* Model:

\* Beam Tilt:

degrees

☐ Not Applicable

\* Electrical Beam Tilt

☐ Not Applicable

\* Mechanical Beam Tilt

☒ Not Applicable

\* Polarization: ☒ Horizontal ☐ Circular ☐ Elliptical

Elevation Radiation Pattern

\* Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt?

- ☐ Yes ☒ No

\* Out-of-Channel Emission Mask:

- ☒ Full Service
- ☐ Simple
- ☐ Stringent