

**Engineering Statement
Special Temporary Authority**
prepared for
Gray Television Licensee, LLC
K23KK-D Rapid City, SD
Facility ID 182523
Ch. 29 (digital) 0.27 kW

Gray Television Licensee, LLC (“Gray”) is the licensee of Low Power Television (“LPTV”) station K23KK-D, Channel 23, Facility ID 182523, Rapid City, SD (BLDTL-20140228ABM). K23KK-D has been silent since March 20, 2014 (BLSTA-20140331AEH). This statement supports *Gray’s* request for Special Temporary Authority (“STA”) to operate K23KK-D on Channel 29 on an interim basis.

The K23KK-D license was recently assigned to *Gray* pursuant to file number BALDTL-20150109AAE, as consummated on March 1, 2015. The licensed K23KK-D facility was decommissioned by the former licensee and is not available for *Gray’s* use. *Gray* has obtained a Construction Permit (“CP” BMPDTL-20150126ABS) to locate the K23KK-D transmitting antenna on the tower structure utilized by commonly owned KEVN-TV (Ch. 7, Facility ID 34347, Rapid City, SD) associated with Antenna Structure Registration number 1042276. Pending construction of that facility, the STA sought herein by *Gray* seeks to operate K23KK-D on digital Channel 29 in lieu of the authorized Channel 23. The STA facility will allow interim operation which can be implemented in a short timeframe in order for K23KK-D to resume operation prior to the 12 month anniversary of the date of going silent.

A different channel is requested due to equipment availability. *Gray* is unable to secure a Channel 23 transmitter on short notice, however a low power Channel 29 transmitter is among surplus equipment owned by *Gray*. The transmitter has been shipped to the KEVN-TV tower site and is currently being setup and tested off-line.

The CP for K23KK-D specifies operation at 15 kW effective radiated power (“ERP”) with a nondirectional antenna centered 155 meters above ground level (“AGL”). The proposed STA facility on Channel 29 will operate at the same site and antenna height as that specified in the CP but with reduced power and a directional antenna. The proposed STA operation will utilize an existing side-mounted directional antenna, which is currently not in use, centered 155 meters above ground level on the KEVN-TV tower. The proposed STA facility will operate with 0.27 kW ERP. No change to the overall structure height is proposed.

A summary of the proposed STA facility’s technical specifications is supplied in Table 1. The STA facility’s 51 dBμ contour does not extend beyond that of the CP facility, as depicted in the attached Figure 1.

Interference study per OET Bulletin 69¹ shows that the proposal complies with the FCC’s interference protection requirements toward all digital television, television translator, LPTV, and Class A stations. **Interference analysis with a “full service” out of channel emission mask is requested** (note that the CDBS STA form has not been updated and only provides “simple” and “stringent” mask selections). 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.

Human Exposure to Radiofrequency Electromagnetic Field

The proposed STA operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC’s OET Bulletin Number. 65. Based on OET-65 equation (10) and the worst-case of 100% field at all elevations, the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $0.4 \mu\text{W}/\text{cm}^2$, which is 0.1 percent of the general population/uncontrolled maximum permitted exposure limit.

¹FCC 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.

This is well 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. When the antenna's elevation pattern is considered, the calculated electromagnetic field will be even lower.

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 continue to be posted. With respect to worker safety, the 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.

Certification

The undersigned hereby certifies that the foregoing statement and associated attachments were prepared by him or under his direction, and that they are true and correct to the best of his knowledge and belief.



Joseph M. Davis, P.E.
March 13, 2015

Chesapeake RF Consultants, LLC
207 Old Dominion Road
Yorktown, VA 23692
703-650-9600

List of Attachments

Table 1	Engineering Data
Table 2	Interference Analysis Results Summary
Figure 1	Coverage Contour Comparison

Table 1
Engineering Data
Special Temporary Authority
prepared for
Gray Television Licensee, LLC
K23KK-D Rapid City, SD

Channel:	29 (560-566 MHz)
Site Coordinates: (NAD-27)	44° 04' 00" N-Lat 103° 15' 01" W-Lon
Antenna Structure Registration number:	1042276
Site elevation:	1133 m AMSL
Overall height above ground:	191 m
Antenna Radiation Center Height	
Above ground:	155 m
Above mean sea level:	1288 m
Effective Radiated Power:	0.27 kW (-5.69 dBk) Digital
Out of Band Emission Mask:	Full Service
Antenna:	RFT CS-2030-DC-8R Gain 11.82 dBd Directional, Horizontal polarization
Transmission Line:	Heliac HJ7-50A 1-5/8" coaxial 50 Ohm 720 feet length 3.66 dB loss
Transmitter Power Output:	0.041 kW (-13.85 dBk)

Directional Antenna Azimuthal Pattern

Rotate Pattern 0 degrees

Azimuth (degrees)	Relative Field	Azimuth (degrees)	Relative Field	Azimuth (degrees)	Relative Field	Azimuth (degrees)	Relative Field	Azimuth (degrees)	Relative Field	Azimuth (degrees)	Relative Field
0	0.990	10	1.000	20	0.970	30	0.940	40	0.920	50	0.900
60	0.900	70	0.910	80	0.920	90	0.940	100	0.970	110	1.000
120	0.980	130	0.940	140	0.870	150	0.770	160	0.680	170	0.580
180	0.500	190	0.400	200	0.270	210	0.200	220	0.170	230	0.230
240	0.260	250	0.230	260	0.180	270	0.200	280	0.280	290	0.390
300	0.510	310	0.600	320	0.680	330	0.780	340	0.870	350	0.950

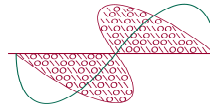
Table 2

Interference Analysis Results Summary

prepared for

Gray Television Licensee, LLC

K23KK-D Rapid City, SD



Chesapeake RF Consultants, LLC

Radiofrequency Consulting Engineers
Digital Television and Radio

K23KK-D USERRECORD-01 RAPID CITY SD US
Channel 29 ERP 0.27 kW HAAT 180. m RCAMSL 01288 m FULL SERVICE MASK
Latitude 044-04-00 Longitude 0103-15-01
Dir Antenna Make usr Model K23KK-D_STA Beam tilt N Ref Azimuth 0.

<u>Ch.</u>	<u>Call</u>	<u>City/State</u>	<u>Dist</u>	<u>Status</u>	<u>Application Ref. No.</u>	<u>---Population (2000 Census)---</u>	
			<u>(km)</u>			<u>Baseline</u>	<u>New Interference</u>
27	KWBH-LP	RAPID CITY SD	2.9	LIC	BLTTL-19970801JA	---	none
28	K28NH-D	MURDO SD	203.1	CP	BNPDTL-20100510AIO	---	none
28	K28MI-D	STURGIS SD	45.0	CP	BNPDTL-20100505AIU	---	none
28	K28NI-D	WASTA SD	69.6	CP	BNPDTL-20100510AHL	---	none
28	K28KM-D	CLARETON WY	153.9	LIC	BLDTL-20091106ABM	---	none
29	K29GI-D	HOLYOKE CO	402.0	LIC	BLDTT-20110613AAQ	---	none
29	K29KB-D	MILES CITY MT	329.3	CP	BNPDTL-20100506AEP	---	none
29	K29KA-D	NEW SALEM ND	334.9	CP	BNPDTL-20100505AMH	---	none
29	KSTF	SCOTTSBLUFF NE	232.3	LIC	BLANK-1046	---	none
29	KPLO-TV	PIERRE SD	234.3	LIC	BLCDT-20130116AAF	---	none
29	K29JO-D	DOUGLAS WY	223.8	LIC	BLDTT-20101005AAM	---	none
29	NEW	SHERIDAN WY	313.6	APP	BNPDTT-20090902ABD	---	none
29	KSWY-LP	SHERIDAN WY	298.4	LIC	BLTTL-20100422ADU	---	none
30	K30MD-D	CAPUTA SD	27.6	CP	BNPDTL-20100505AIX	86,222	1,620 (1.88%)
30	K30NR-D	KADOKA SD	134.1	CP	BNPDTL-20100510AHQ	---	none
30	K30MX-D	WYODAK WY	177.6	LIC	BLDTT-20120614ABG	---	none

Figure 1
Coverage Contour Comparison
Authorized Facility and Proposed STA
K23KK-D Rapid City, SD
Facility ID 182523

prepared for
Gray Television Licensee, LLC

March, 2015

