

ENGINEERING EXHIBIT

Application for Modification of Digital Low Power Television Construction Permit

prepared for

Gray Television Licensee, LLC

K23MM-D Alexandria, LA

Facility ID 187970

Ch. 23 (digital) 4.8 kW

Gray Television Licensee, LLC (“Gray”) is the proposed assignee (BAPDTL-20160811AAB) of digital Low Power Television (“LPTV”) station K23MM-D, Channel 23, Facility ID 187970, Alexandria, LA. K23MM-D is authorized to operate pursuant to a Construction Permit (“CP”, BNPDTL-20100816ABA) with 15 kW effective radiated power (“ERP”), directional. *Gray* herein seeks a modification of the CP to utilize an alternate transmitting location and to specify changes of ERP, antenna height, and directional antenna pattern. The present permittee of K23MM-D, *EICB-TV East, LLC*, is submitting this application as a courtesy to *Gray* because the FCC’s Licensing and Management System (LMS) does not allow proposed assignees to file contingent applications.

As proposed herein, K23MM-D will be relocated to the studio location associated with KALB-TV (Ch. 35, Facility ID 51598, Alexandria, LA), 8.1 km (5.0 miles) from the authorized K23MM-D site. *Gray* is the licensee of KALB-TV. The proposed K23MM-D will utilize a directional transmitting antenna to be side mounted on a pole atop the KALB-TV studio building. The structure does not require an FCC Antenna Structure Registration number since it does not extend more than 6.1 meters above the rooftop. The site is located more than 121 kilometers (75 miles) from the reference coordinates of the cities listed in Appendix A of DA 09-1487.¹

¹“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.

The proposed K23MM-D facility will operate with a directional antenna at 4.8 kW ERP using a “stringent” out of channel emission mask. A plot of the directional antenna’s azimuthal pattern is supplied in Figure 1. Figure 2 depicts the 51 dB μ coverage contour of the proposed facility as well as that of the current CP facility. The service area overlap demonstrates compliance with §73.3572 for a minor change.

Interference study per OET Bulletin 69² 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 680 km distant at Kingsville, TX. 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 location is beyond the border areas requiring international coordination.

The only authorized AM station within 3 km of the proposed site is directional AM station KJMJ (580 kHz, Alexandria, LA) which is located 2.8 km distant. The proposal does not involve construction or modification of an antenna support structure that would exceed a height of five electrical degrees at KJMJ’s frequency. Therefore, notification to KJMJ and consideration of AM pattern disturbance is not required.

²FCC 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.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed K23MM-D operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. The transmitting antenna is a Kathrein panel array. Figure 3 supplies a plot of the antenna's elevation pattern as provided by the manufacturer. Based on OET-65 equation (10), and considering the antenna relative field in downward elevations, the graph in Figure 4 depicts calculated power density levels attributable to the proposed K23MM-D at locations near the site at a height of two meters above ground level. The maximum calculated RF electromagnetic field attributable to the proposed K23MM-D facility is 41.2 percent of the general population / uncontrolled MPE limit at any location two meters above ground level, which occurs within 25 meters of the transmitting antenna location.

One other LPTV facility emitter is proposed to be located at this site. By separate application, K33MP-D (Ch. 33, Facility ID 186715, Alexandria LA) will also be located at the same building rooftop. The maximum calculated RF electromagnetic field attributable to the proposed K33MP-D facility is 37.0 percent of the general population / uncontrolled MPE limit at any location two meters above ground level (as described in the K33MP-D application for modification of CP, to be submitted contemporaneously).

Based on this analysis and considering both facilities, the total maximum calculated RF density at two meters above ground level near the proposed site will be 78.2 percent of the FCC's uncontrolled / general population maximum permissible exposure limit. No other television broadcast, radio broadcast, or other nonexcluded facilities are known to be within sufficient distance to be a significant contributor to RF exposure at this location.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. Access to the building's rooftop will be restricted. The K33MM-D facility will reduce power or cease operation as necessary to protect persons having access to the rooftop, pole, or antenna from RF electromagnetic field exposure in excess of FCC guidelines. RF exposure warning signs will be posted at rooftop access points. Environmental matters covered by this exhibit are limited to the evaluation of exposure to RF electromagnetic field.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Figure 3	Antenna Elevation Pattern
Figure 4	Calculated RF Electromagnetic Field
Table 1	Interference Analysis Results Summary
Form 2100	Engineering Data for FCC Form 2100

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	September 2, 2016	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

**Azimuth Pattern - Relative Field
(True North)**

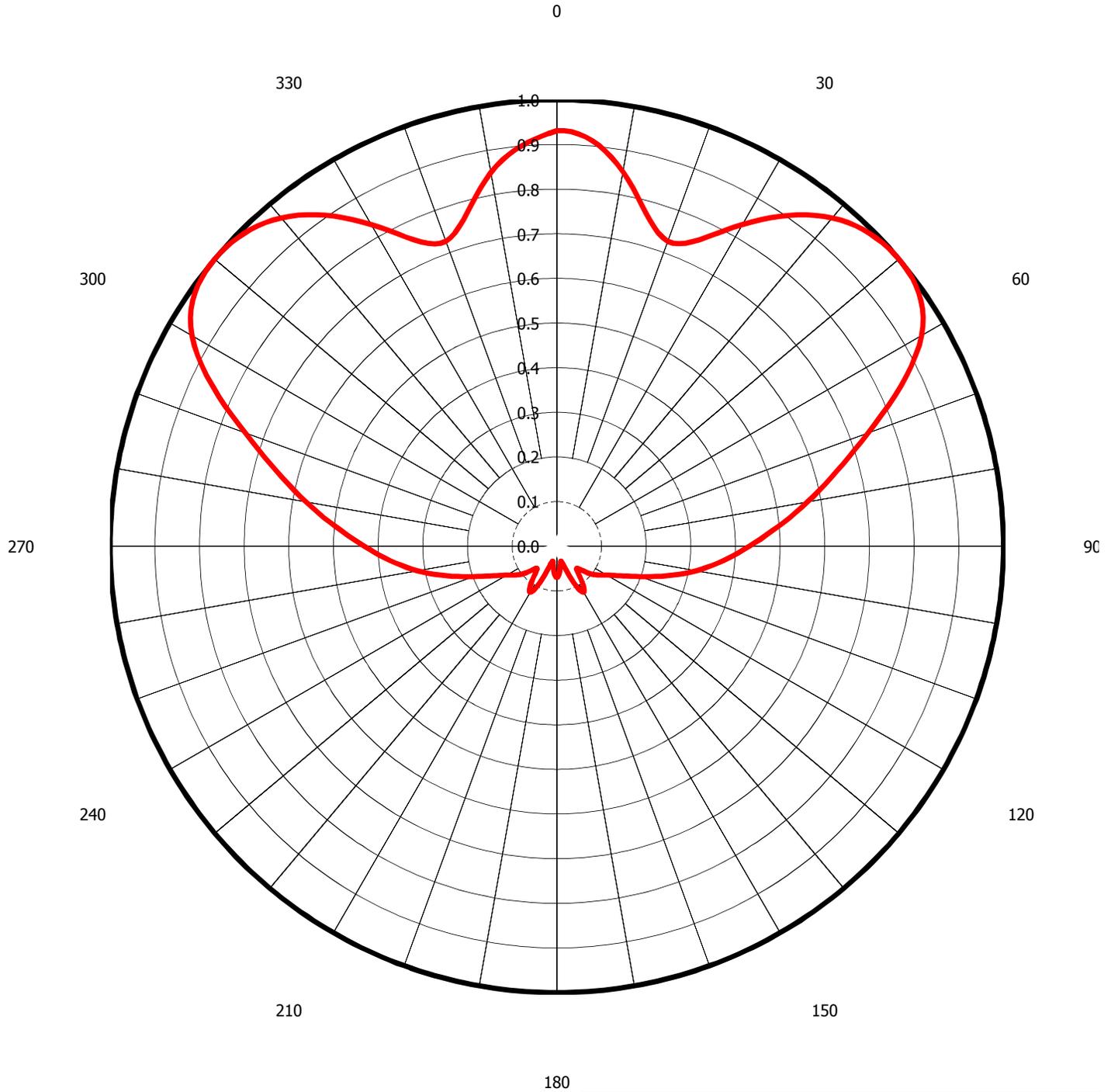


Figure 1
Antenna Azimuthal Pattern
K23MM-D Alexandria, LA
Facility ID 187970
Ch. 23 (digital) 4.8 kW

prepared for
Gray Television Licensee, LLC

September, 2016

Figure 2
Coverage Contour Comparison
K23MM-D Alexandria, LA
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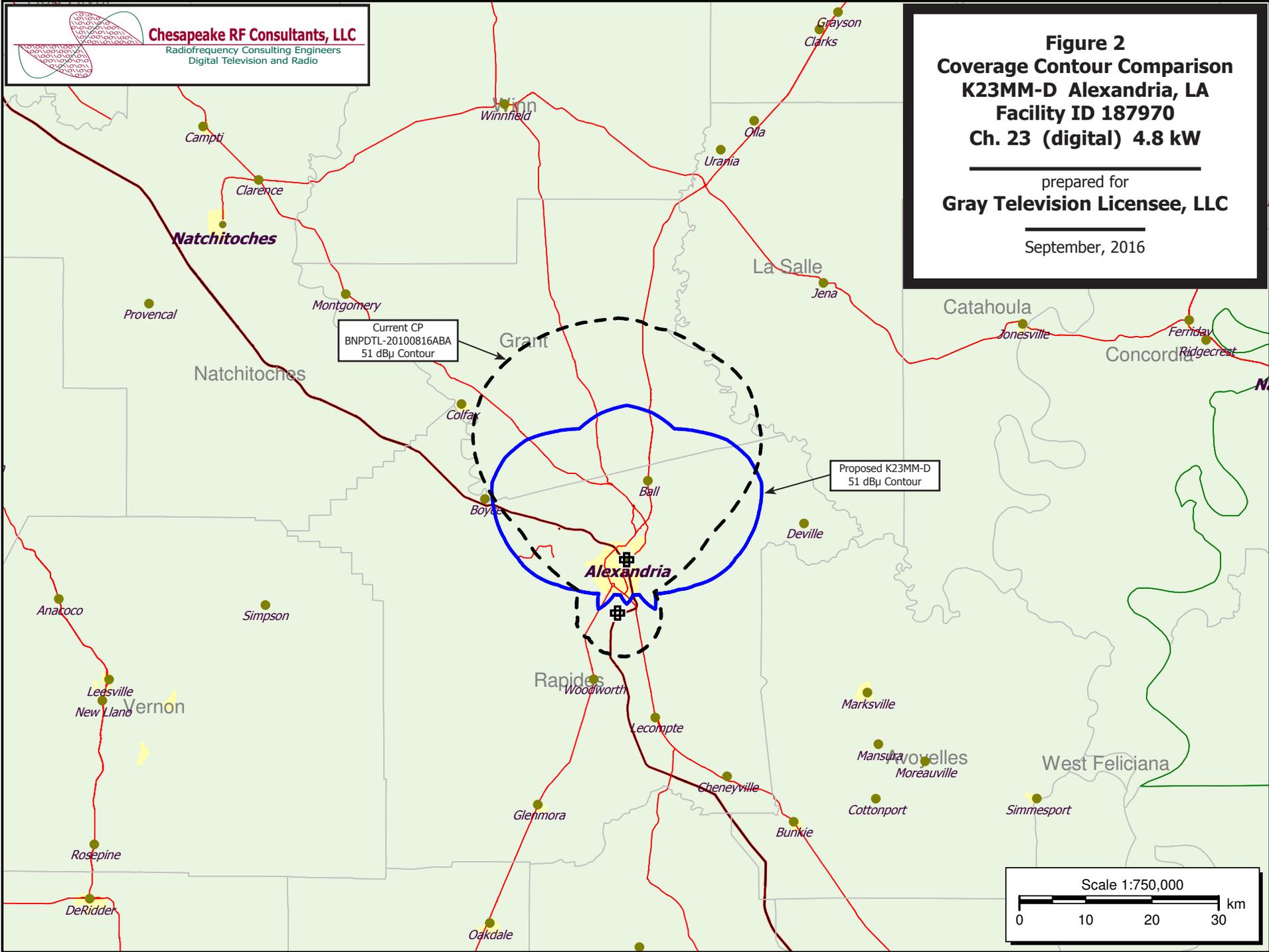




Figure 3
Antenna Elevation Pattern
Kathrein Model K723147 1x2
K23MM-D Alexandria, LA
Facility ID 187970
Ch. 23 (digital) 4.8 kW

prepared for
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September, 2016

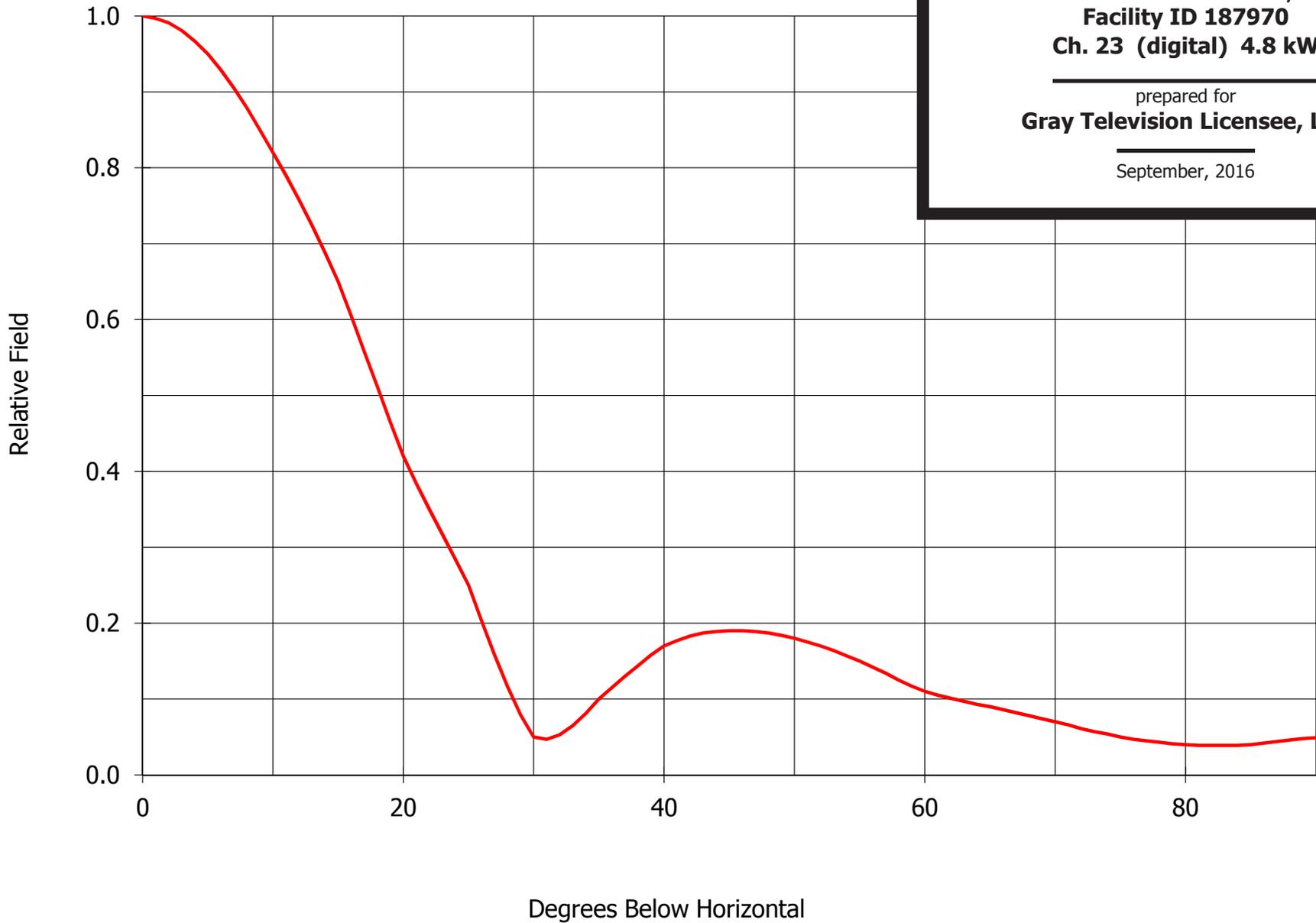


Figure 4
Calculated RF Electromagnetic Field
K23MM-D Alexandria, LA
Facility ID 187970
Ch. 23 (digital) 4.8 kW

prepared for
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September, 2016

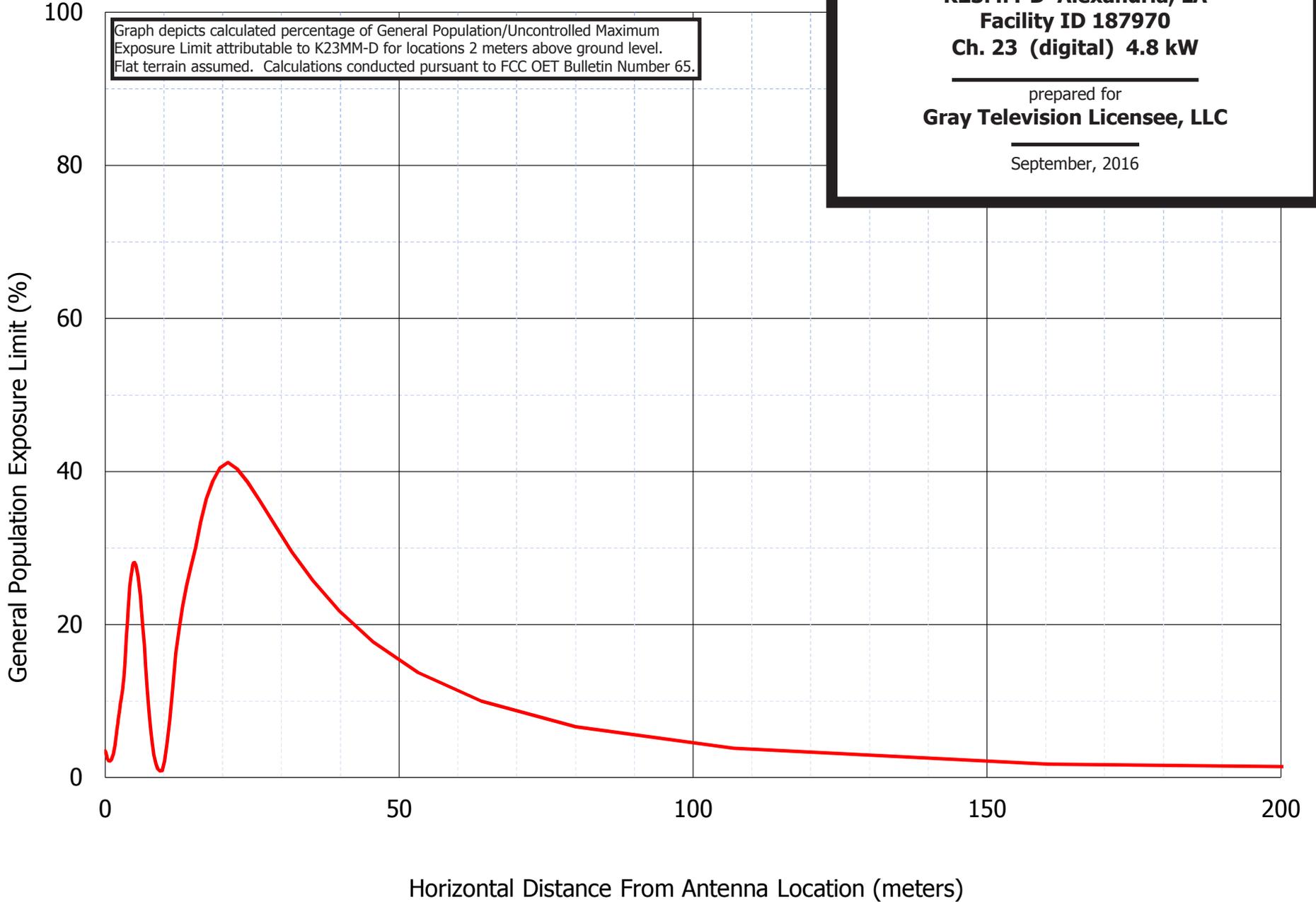


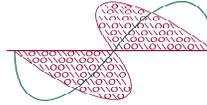
Table 1

Interference Analysis Results Summary

prepared for

Gray Television Licensee, LLC

K23MM-D Alexandria, LA



Chesapeake RF Consultants, LLC

Radiofrequency Consulting Engineers
Digital Television and Radio

K23MM-D	USERRECORD-01	ALEXANDRIA	LA US
Channel 23	ERP 4.8 kW	HAAT 30. m	RCAMSL 00031 m
STRINGENT MASK			
Latitude 031-18-29		Longitude 0092-26-43	
Dir Antenna	Make usr	Model K723147	1x2 Beam tilt N Ref Azimuth 0.

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 (km)	Status	Application Ref. No.	---Population (2000 Census)---	
						Baseline	New Interference
22	K22GT	LAKE CHARLES LA	166.7	LIC	BLTTL-20060103ABZ	---	none
22	KDCG-CD	OPELOUSAS LA	116.8	LIC	BLDTA-20140813AAQ	---	none
22	K22IB-D	VIDALIA LA	108.5	CP	BDCDDTT-20061024AFE	---	none
23	KLMB-CD	EL DORADO AR	211.9	LIC	BLANK-4909	---	none
23	KJEP-LP	NASHVILLE AR	322.5	LIC	BLTTL-19960111AE	---	none
23	WSTY-LP	HAMMOND LA	205.4	LIC	BLTTL-19990104JE	---	none
23	KLPB-TV	LAFAYETTE LA	110.7	LIC	BLEDT-20130820AAH	---	none
23	W23EC-D	LAKE CHARLES LA	140.4	CP	BNPDTL-20100407ABO	---	none
23	WHPM-LD	HATTIESBURG MS	287.9	LIC	BLDTL-20111201MCO	---	none
23	WWJX	JACKSON MS	215.7	LIC	BLCDT-20110824ABD	---	none
23	K23HY-D	IDABEL OK	362.1	LIC	BLDTT-20091228AEM	---	none
23	K23MJ-D	BEAUMONT TX	195.8	CP	BNPDTL-20090825AYJ	---	none
23	K23MJ-D	BEAUMONT TX	201.6	CP MOD	BLANK-7969	---	none
23	KAGS-LD	BRYAN TX	385.5	LIC	BLDTL-20101026AAZ	---	none
23	KLTJ	GALVESTON TX	351.5	LIC	BLEDT-20110127ACD	---	none
23	KNCD-LP	Lufkin TX	212.8	CP	BLANK-10678	---	none
23	K23LD-D	TYLER TX	291.6	CP	BNPDTL-20100422ADA	---	none
24	K24LJ-D	ALEXANDRIA LA	8.0	CP	BNPDTL-20100511ABM	---	none
24	W24DX-D	IOWA LA	126.7	CP	BNPDTL-20100407ABU	---	none
24	KLTS-TV	SHREVEPORT LA	206.5	LIC	BLEDT-20100216ABQ	---	none
24	K24KQ-D	BEAUMONT TX	195.8	CP	BNPDTT-20090825BRG	---	none
27	KWCE-LP	ALEXANDRIA LA	4.0	LIC	BLTTL-20060714ACI	---	none
30	W06DD	NATCHEZ MS	104.8	LIC	BLTTL-20060103ABY	---	none

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	187970
	State	Louisiana
	City	ALEXANDRIA
	LPD Channel	23

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	No
	ASR Number	
Coordinates (NAD83)	Latitude	31° 18' 30.1" N+
	Longitude	092° 26' 43.6" W-
	Structure Type	BPOLE-Building with POLE /ANTENNA on top
	Overall Structure Height	8.5 meters
	Support Structure Height	6.1 meters
	Ground Elevation (AMSL)	23 meters
Antenna Data	Height of Radiation Center Above Ground Level	7.6 meters
	Height of Radiation Center Above Mean Sea Level	30.6 meters
	Effective Radiated Power	4.8 kW

**Antenna
Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Directional Custom
	Do you have an Antenna ID?	No
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	KAT
	Model	K723147 1x2
	Rotation	0 degrees
	Electrical Beam Tilt	Not Applicable
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Horizontal
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?	No
	Uploaded file for elevation antenna (or radiation) pattern data	
	Out-of-Channel Emission Mask:	Stringent

Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	V _A (Authorized Value)						
0	0.931	90	0.431	180	0.070	270	0.431
10	0.852	100	0.317	190	0.045	280	0.57
20	0.727	110	0.199	200	0.048	290	0.743
30	0.832	120	0.129	210	0.119	300	0.943
40	0.96	130	0.095	220	0.069	310	1
50	1	140	0.069	230	0.095	320	0.96
60	0.943	150	0.119	240	0.129	330	0.832
70	0.742	160	0.048	250	0.199	340	0.727
80	0.57	170	0.045	260	0.317	350	0.85

Additional Azimuths

Degree	V _A
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