

## **ENGINEERING EXHIBIT**

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

prepared for

#### **Gray Television Licensee, LLC**

WIDM-LD Panama City, FL

Facility ID 182841

Ch. 19 (digital) 4.8 kW

*Gray Television Licensee, LLC* (“Gray”) is the proposed assignee (BAPDTL-20160728AEV) of digital Low Power Television (“LPTV”) station WIDM-LD, Channel 19, Facility ID 182841, Panama City FL. WIDM-LD is authorized to operate pursuant to a Construction Permit (“CP”, file# 0000011203) 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 WIDM-LD, *DTV America Corporation*, 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, WIDM-LD will be relocated to the studio location associated with WJHG-TV (Ch. 18, Facility ID 73136, Panama City, FL), 27.0 km (16.8 miles) from the authorized WIDM-LD site. *Gray* is the licensee of WJHG-TV. The proposed WIDM-LD will utilize a directional transmitting antenna to be side mounted on a pole atop the WJHG-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.<sup>1</sup>

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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.

The proposed WIDM-LD 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 dBμ coverage contour of the proposed facility as well as those of the current and original<sup>2</sup> CP facilities, and demonstrates that the proposed contour has overlap with those of the existing and original CP facilities. The service area overlap demonstrates compliance with §73.3572 for a minor change.

Interference study per OET Bulletin 69<sup>3</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 420 km distant at Powder Springs, GA. 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 nondirectional AM station WPCF (1290 kHz, Panama City Beach, FL) which is located 0.75 km distant. The distance to WPCF is greater than the 0.23 km threshold distance (one wavelength at WPCF’s frequency) described in §1.30002(a), therefore notification to WPCF and consideration of AM pattern disturbance is not required.

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<sup>2</sup>The original CP, BNPDTL-20090825BWV, authorized a site 41.5 km (25.8 miles) distant from the location now proposed.

<sup>3</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.

### **Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposed WIDM-LD 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 WIDM-LD at locations near the site at a height of two meters above ground level. The maximum calculated RF electromagnetic field attributable to the proposed WIDM-LD facility is 21.2 percent of the general population / uncontrolled MPE limit at any location two meters above ground level, which occurs within 35 meters of the tower's base.

One other LPTV facility emitter is proposed to be located at this site. By separate application, W16CX-D (Ch. 16, Facility ID 182839, Panama City FL) will also be located at the same building rooftop. The maximum calculated RF electromagnetic field attributable to the proposed W16CX-D facility is 21.9 percent of the general population / uncontrolled MPE limit at any location two meters above ground level (as described in the W16CX-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 43.1 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 WIDM-LD 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.

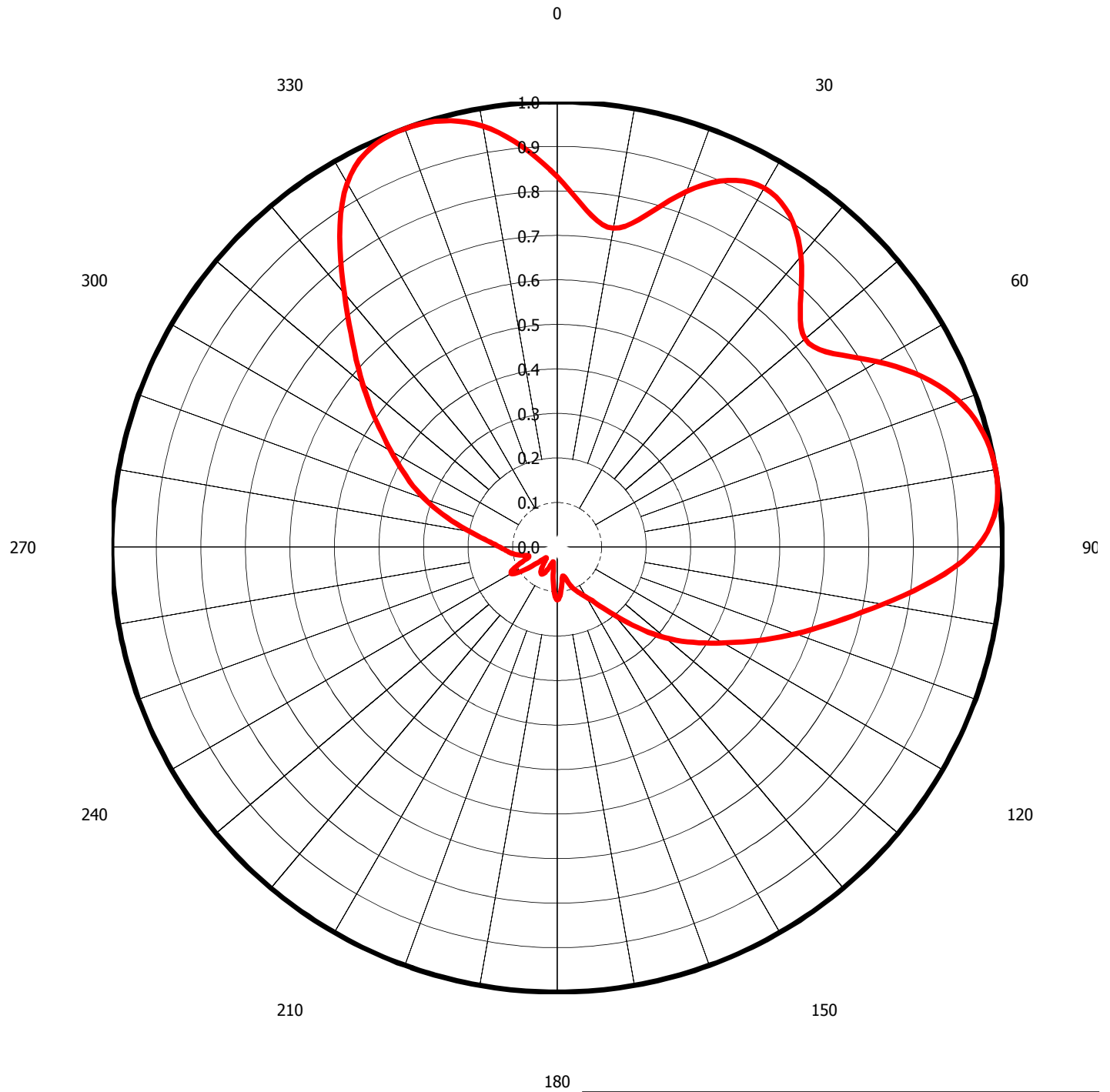
List of Attachments

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.	August 10, 2016	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

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



**Figure 1**  
**Antenna Azimuthal Pattern**  
**WIDM-LD Panama City, FL**  
**Facility ID 182841**  
**Ch. 19 (digital) 4.8 kW**

prepared for  
**Gray Television Licensee, LLC**

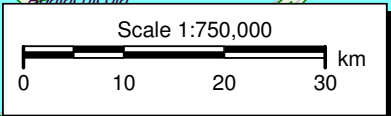
August, 2016



**Figure 2**  
**Coverage Contour Comparison**  
**WIDM-LD Panama City, FL**  
**Facility ID 182841**  
**Ch. 19 (digital) 4.8 kW**

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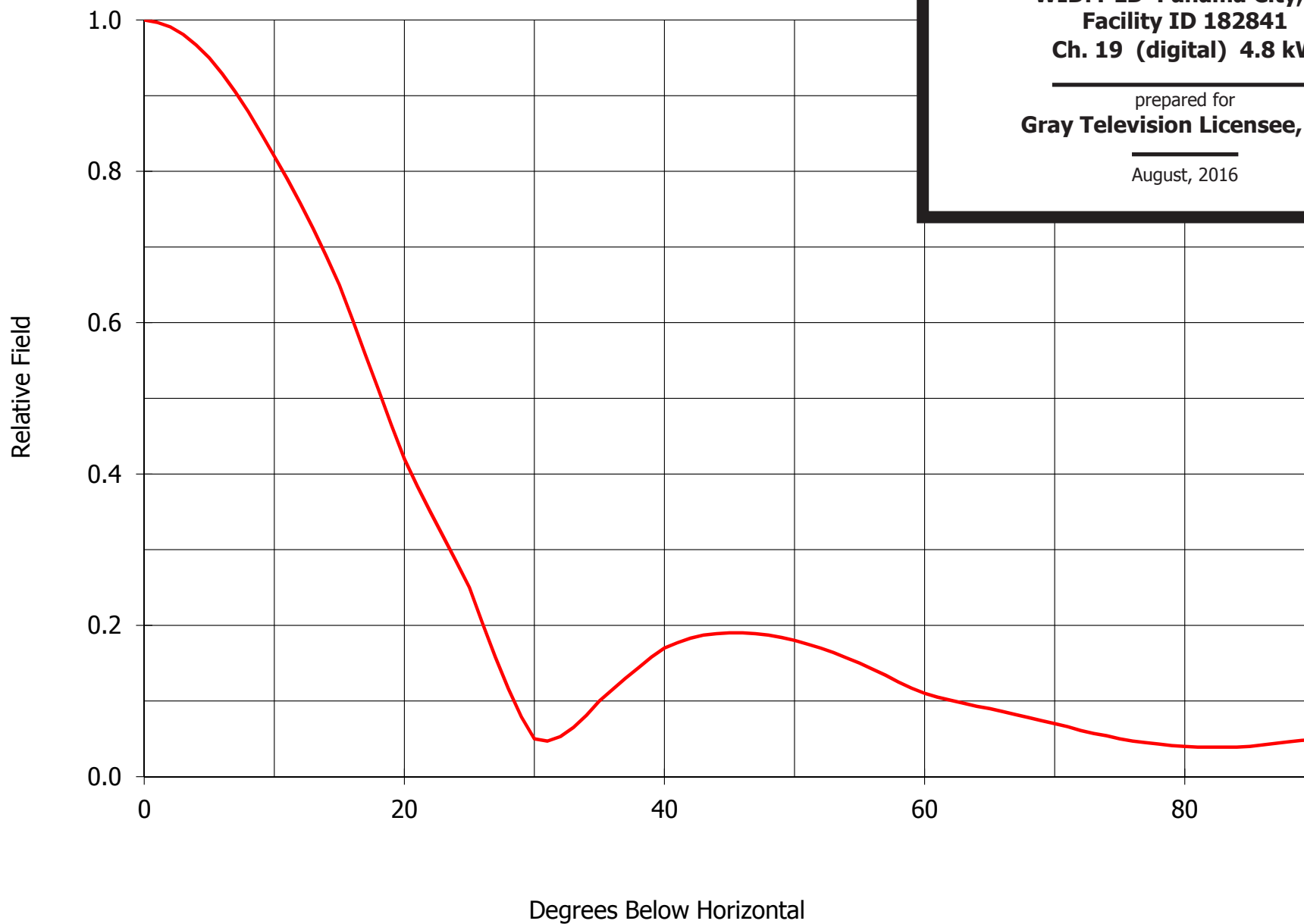
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**Figure 3**  
**Antenna Elevation Pattern**  
**Kathrein Model K723147 1x2**  
**WIDM-LD Panama City, FL**  
**Facility ID 182841**  
**Ch. 19 (digital) 4.8 kW**

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**Figure 4**  
**Calculated RF Electromagnetic Field**  
**WIDM-LD Panama City, FL**  
**Facility ID 182841**  
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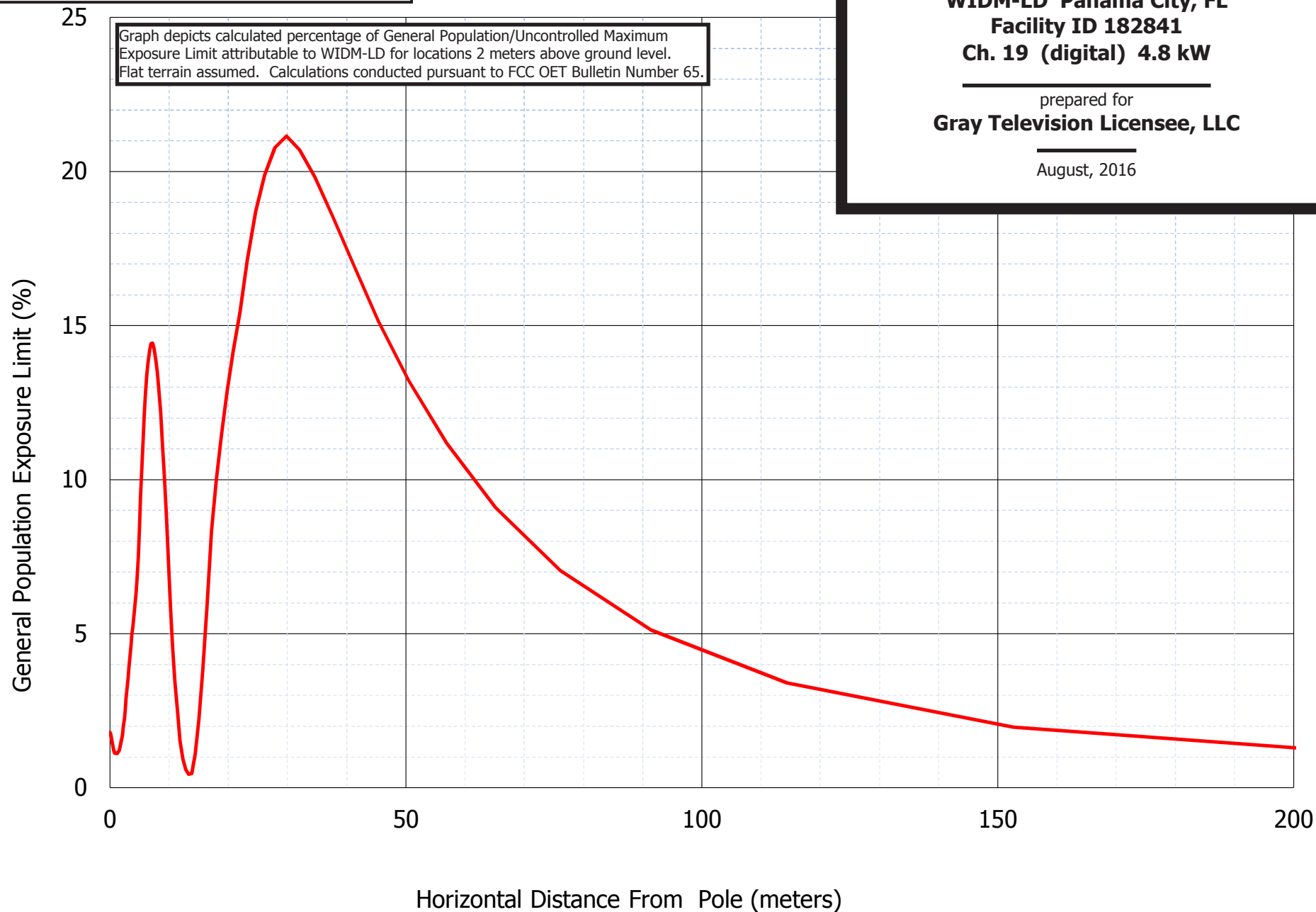




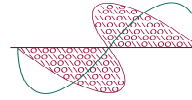
Table 1

**Interference Analysis Results Summary**

prepared for

**Gray Television Licensee, LLC**

WIDM-LD Panama City, FL

**Chesapeake RF Consultants, LLC**Radiofrequency Consulting Engineers  
Digital Television and Radio

WIDM-LD	USERRECORD-01	PANAMA CITY	FL US
Channel 19	ERP 4.8 kW	HAAT 30. m	RCAMSL 00010 m
STRINGENT MASK			
Latitude 030-11-01 Longitude 0085-46-36			
Dir Antenna Make usr Model K723147 1x2 Beam tilt N Ref Azimuth 30.			

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
18	WAWA-LD	DOTHAN AL	122.7	CP	BNPDTL-20090825ANQ	---	none
18	W18EI-D	MARIANNA FL	79.7	CP	BNPDTL-20090825AWL	---	none
18	NEW	MONTICELLO FL	179.0	APP	BNPDTL-20090825BMH	---	none
18	WJHG-TV	PANAMA CITY FL	41.5	LIC	BLANK-1551	---	none
18	NEW	QUINCY FL	119.9	APP	BNPDTL-20090825AMN	---	none
18	NEW	TALLAHASSEE FL	147.3	APP	BNPDTL-20090825BIA	---	none
18	NEW	TALLAHASSEE FL	147.3	APP	BNPDTL-20090825ALY	---	none
19	WIIQ	DEMOPOLIS AL	313.7	LIC	BLEDT-20090511AHE	---	none
19	WOTM-LD	MONTEVALLO AL	345.0	LIC	BLTTL-19970514JI	---	none
19	WOTM-LD	MONTEVALLO AL	344.2	CP	BDFCDTL-20140424AII	---	none
19	WOTM-LD	MONTEVALLO AL	344.2	LIC	BLANK-4826	---	none
19	WDSF-LD	MONTGOMERY AL	256.3	LIC	BLANK-1458	---	none
19	NEW	GAINESVILLE FL	322.7	APP	BNPDTL-20090825ANR	---	none
19	WJAX-TV	JACKSONVILLE FL	404.1	LIC	BLCDDT-20030328ANV	---	none
19	W19CO-D	PENSACOLA FL	150.3	LIC	BLDTL-20100408ACF	---	none
19	NEW	TALLAHASSEE FL	181.5	APP	BNPDTL-20090825BLU	---	none
19	NEW	TALLAHASSEE FL	147.0	APP	BNPDTL-20090825AAO	---	none
19	NEW	ALBANY GA	221.4	APP	BNPDTL-20090825AII	---	none
19	NEW	ALBANY GA	221.4	APP	BNPDTL-20090825CAA	---	none
19	NEW	CAMILLA/MOULTRIE GA	192.2	APP	BNPDTL-20090825AYL	---	none
19	W19DW-D	COLUMBUS GA	270.5	CP	BMJADTL-20100524ACV	---	none
19	W19DW-D	COLUMBUS GA	270.4	APP	BLANK-13222	---	none
19	WANX-LP	COLUMBUS GA	256.3	LIC	BLTTL-20070813AAT	---	none
19	NEW	HOMERVILLE GA	294.2	APP	BNPDTL-20090825AGP	---	none
19	W19DN-D	MACON GA	354.2	CP	BNPDTL-20100420AAT	---	none
19	NEW	VALDOSTA GA	241.9	APP	BNPDTL-20090825CAF	---	none
19	W19EB-D	LUMBERTON MS	269.7	APP	BLANK-13257	---	none
19	W19EB-D	LUMBERTON MS	349.1	CP	BNPDTL-20100715AGX	---	none
19	W19EB-D	LUMBERTON MS	304.8	LIC	BLANK-13199	---	none
20	WMPV-TV	MOBILE AL	181.8	LIC	BLCDDT-20100420AAK	---	none
20	WCOV-TV	MONTGOMERY AL	202.4	LIC	BLCDDT-20090312AAO	---	none
20	W20DX-D	PANAMA CITY FL	27.0	CP MOD	BLANK-11204	159,394	1,958 (1.23%)
20	NEW	TALLAHASSEE FL	142.6	APP	BNPDTL-20090825AJC	---	none
26	W26BV	PANAMA CITY FL	85.2	LIC	BLTTL-20001201ABZ	---	none

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	182841
	State	Florida
	City	PANAMA CITY
	LPD Channel	19

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	30° 11' 02.6" N+
	Longitude	085° 46' 35.8" W-
	Structure Type	BPOLE
	Overall Structure Height	6.1 meters
	Support Structure Height	3.7 meters
	Ground Elevation (AMSL)	4.8 meters
Antenna Data	Height of Radiation Center Above Ground Level	5.2 meters
	Height of Radiation Center Above Mean Sea Level	10.0 meters
	Effective Radiated Power	4.8 kW

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	30 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 (Authorized Value)	Degree	V (Authorized Value)	Degree	V (Authorized Value)	Degree	V (Authorized Value)
0	0.931	90	0.431	180	0.070	270	0.431
10	0.852	100	0.317	190	0.045	280	0.570
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	0.960	130	0.095	220	0.069	310	1.000
50	1.000	140	0.069	230	0.095	320	0.960
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	0.570	170	0.045	260	0.317	350	0.850

Additional Azimuths

Degree	V <sub>A</sub>
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