

ENGINEERING EXHIBIT

Application for Minor Modification of Digital Low Power Television Station Construction Permit

prepared for

Gray Television Licensee, LLC

W16EK-D Lenox, GA

Facility ID 186166

Ch. 16 0.7 kW Directional

Gray Television Licensee, LLC (“Gray”) is the permittee of unbuilt digital Low Power Television station W16EK-D, Channel 16, Lenox GA, Facility ID 186166. W16EK-D is authorized to operate pursuant to a Construction Permit (“CP”, file# 0000155449) with 9 kW effective radiated power (“ERP”), directional. The current CP was obtained as a displacement of the previously authorized operation on Channel 47 (callsign W47EC-D, file# BNPDTL-20100510ABK). *Gray* herein seeks a modification of the current CP to specify a different transmitting location and a reduction in ERP.

The proposed facility will employ an antenna to be side-mounted on the existing tower structure associated with FCC Antenna Structure Registration number 1002824. The site is located more than 75 miles (121 km) from the reference coordinates of the markets listed in Appendix A of DA 09-1487¹ and is 28.7 km (17.8 miles) from the originally authorized W47EC-D site (BNPDTL-20100510ABK). No change to the overall structure height is proposed.

The proposed antenna is a Kathrein model 75010325 (single panel) having elliptical polarization. The proposed ERP is 0.70 kW horizontally polarized and 0.30 kW vertically polarized using a “simple” 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

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.

proposed facility as well as that of the original CP facility (BNPDTL-20100510ABK), demonstrating 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.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed facility was evaluated for human exposure to Radiofrequency ("RF") energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10), and considering the antenna relative field in downward elevations, the graph in Figure 3 depicts calculated power density levels attributable to the proposed facility at locations near the site at a height of two meters above ground level. The maximum calculated RF electromagnetic field attributable to the proposed facility is 4.3 percent of the general population / uncontrolled maximum permissible exposure limit at any location two meters above ground level. 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 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. This

²FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 ("OET-69"). This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 1 km cell size, and 1.0 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC's implementation of TVStudy show excellent correlation.

exhibit is limited to the evaluation of exposure to RF electromagnetic field. No change in structure height is proposed.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Figure 3	Calculated RF Electromagnetic Field
Table 1	TVStudy Analysis of Proposal
Form 2100	Saved Version of Engineering Sections of FCC Form at Time of Upload

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E. May 11, 2022
207 Old Dominion Road Yorktown, VA 23692 703-650-9600

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

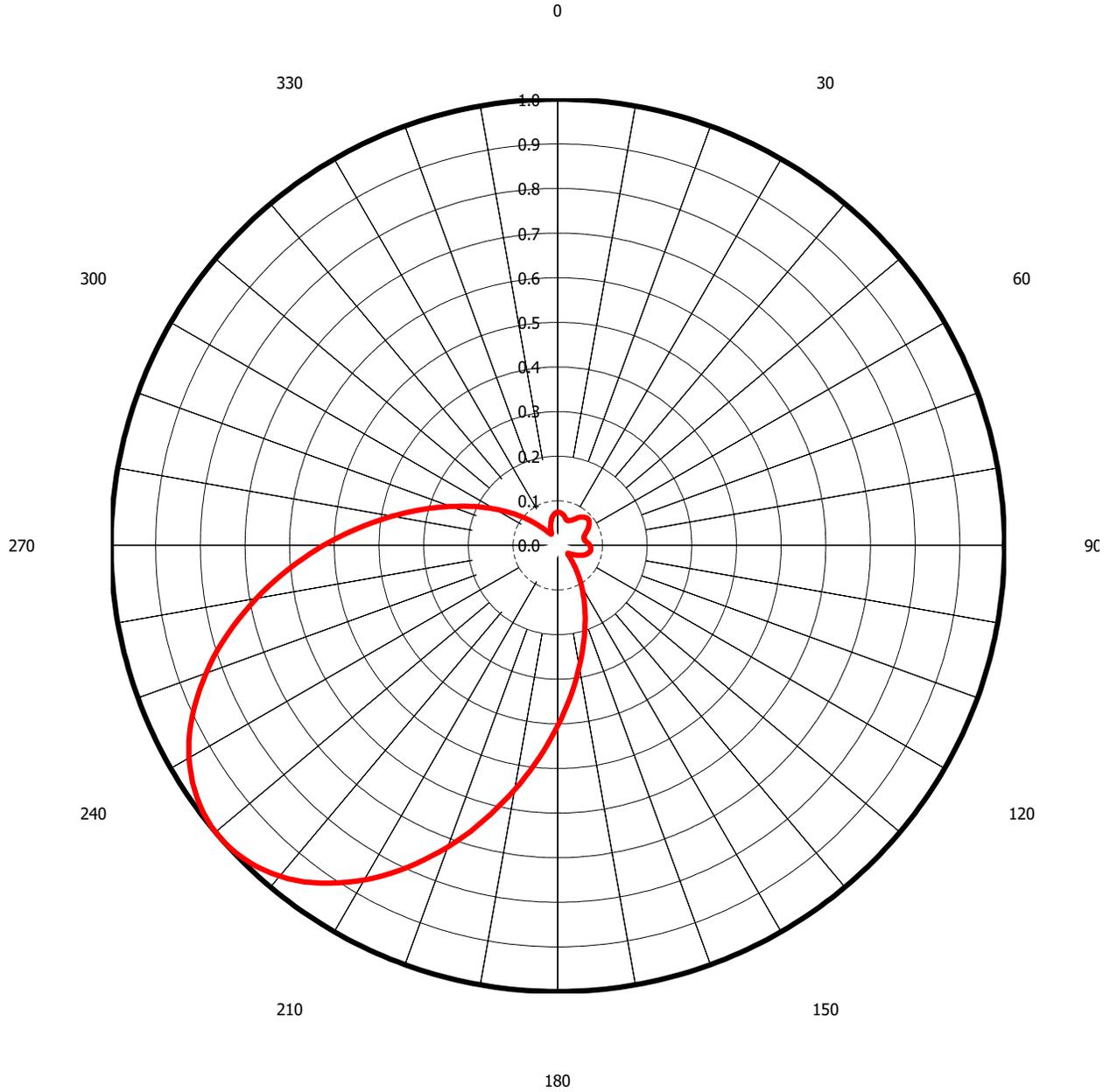
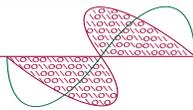


Figure 1
Antenna Azimuthal Pattern
W16EK-D Lenox, GA
Facility ID 186166
Ch. 16 0.7 kW Directional

prepared for
Gray Television Licensee, LLC

May, 2022



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

Figure 2
Coverage Contour Comparison
W16EK-D Lenox, GA
Facility ID 186166
Ch. 16 0.7 kW Directional

prepared for
Gray Television Licensee, LLC

May, 2022

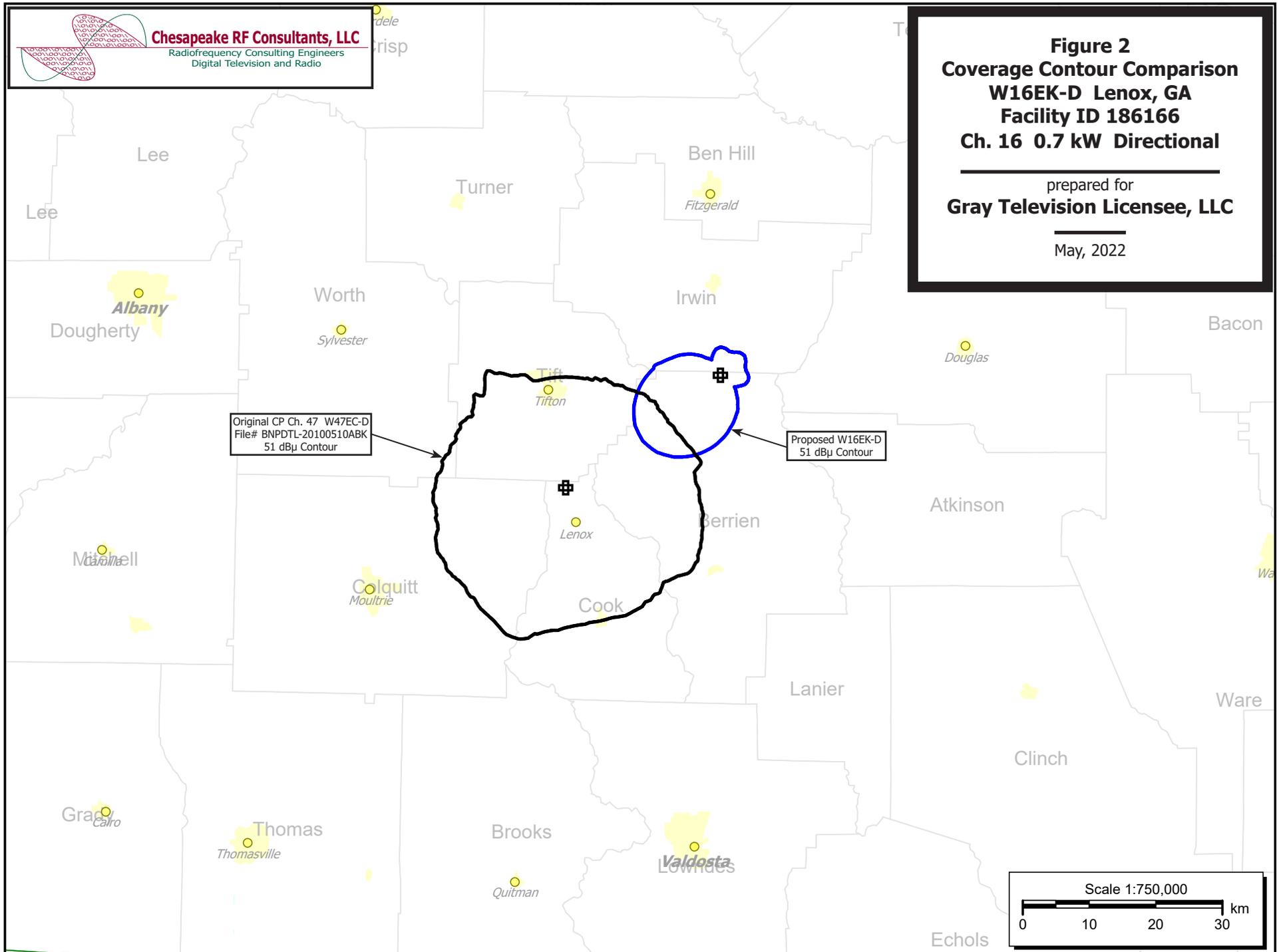




Figure 3
Calculated RF Electromagnetic Field
W16EK-D Lenox, GA
Facility ID 186166
Ch. 16 0.7 kW Directional

prepared for
Gray Television Licensee, LLC

May, 2022

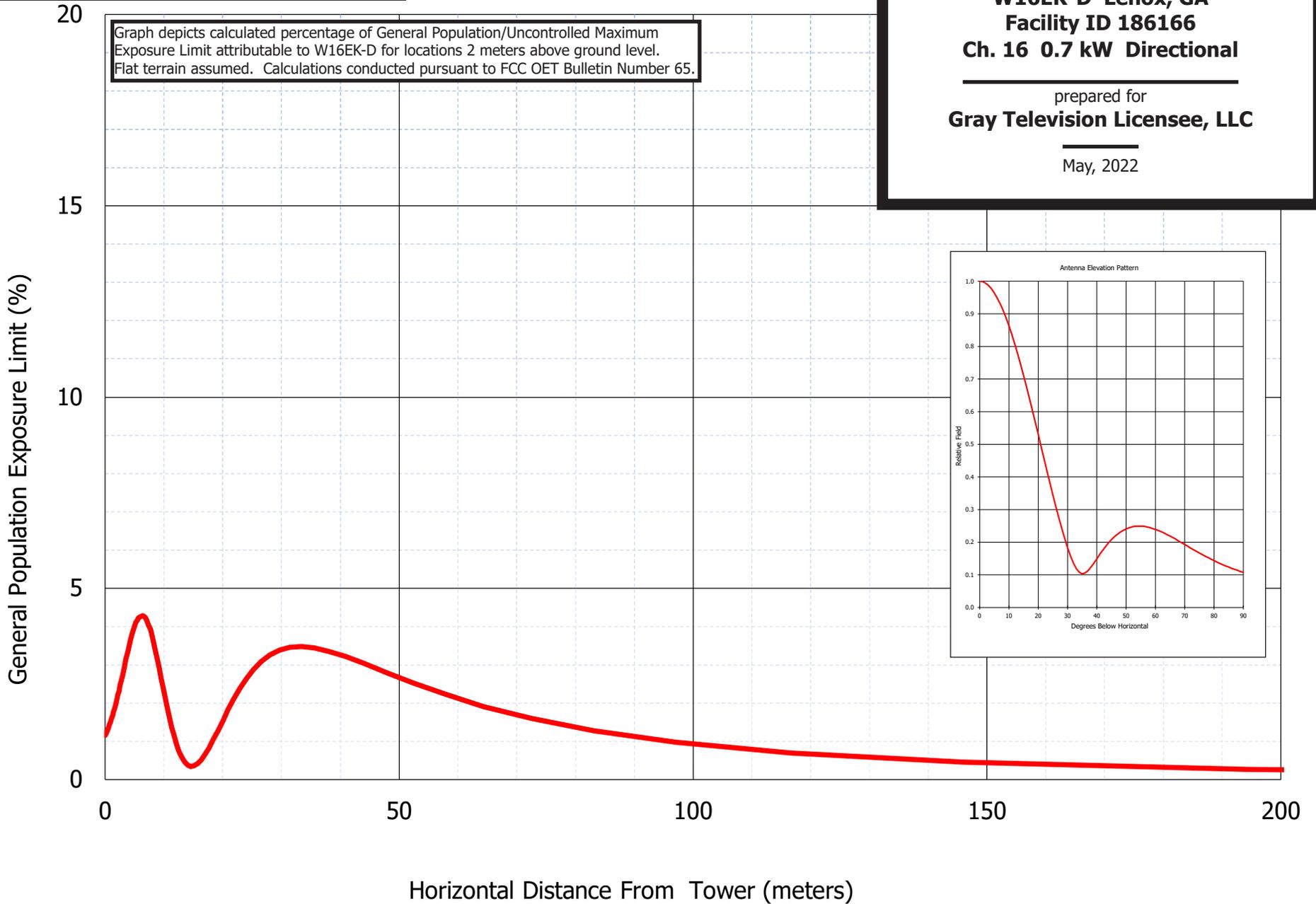


Table 1 W16EK-D TVStudy Analysis of Proposal
 (page 1 of 2)



tvstudy v2.2.5 (4uoc83)
 Database: localhost, Study: W16EK-D 1002824 prop, Model: Longley-Rice
 Start: 2022.05.11 13:51:59

Study created: 2022.05.11 13:51:59

Study build station data: LMS TV 2022-05-11

Proposal: W16EK-D D16 LD APP LENOX, GA
 File number: W16EK-D 1002824 prop
 Facility ID: 186166
 Station data: User record
 Record ID: 4411
 Country: U.S.

Build options:
 Protect pre-transition records not on baseline channel

Search options:
 Baseline record excluded if station has CP

Stations potentially affected by proposal:

IX	Call	Chan	Svc	Status	City, State	File Number	Distance
No	W31FE-D	N14+	TX	LIC	Savannah, GA	BLTT20040915ADW	107.7 km
No	WNFT-LD	D15	LD	LIC	GAINESVILLE, FL	BLDTL20110714ACG	214.1
No	WNFT-LD	D15	LD	CP	GAINESVILLE, FL	BLANK0000106078	214.1
No	WUJX-LD	D15	LD	LIC	JACKSONVILLE, FL	BLANK0000121572	206.7
No	W15EQ-D	D15	LD	LIC	TALLAHASSEE, FL	BLANK0000150951	135.5
No	WPHJ-LD	D15+	LD	LIC	BAXLEY, GA	BLANK0000187241	189.8
No	WRBL	D15	DT	LIC	COLUMBUS, GA	BLCDT20061013ABV	174.6
No	W16DV-D	D16	LD	LIC	Alexander City, AL	BLANK0000190001	255.3
No	WALE-LD	D16	LD	LIC	MONTGOMERY, AL	BLANK0000152783	303.5
No	W16CP-D	D16	LD	CP	CHIPLEY, FL	BNPDTL20090825AVY	235.4
No	W16CS-D	D16	LD	CP	DE FUNIAK SPRINGS, FL	BNPDTL20090825ATU	301.5
No	WCJB-TV	D16	DT	LIC	GAINESVILLE, FL	BLCDT20071119AJB	229.3
No	WRCF-CD	D16	DC	LIC	ORLANDO, FL	BLANK0000099575	381.6
No	WRCF-CD	D16	DC	LIC	ORLANDO, FL	BLANK0000121630	381.6
No	W16CX-D	D16	LD	LIC	PANAMA CITY, FL	BLANK0000013958	281.4
No	WJHG-TV	D16	DT	LIC	PANAMA CITY, FL	BLANK0000068516	240.1
No	W16DQ-D	D16	LD	LIC	TAMPA, FL	BLANK0000122658	416.5
No	DDW38EM-D	D16	LD	APP	ALBANY, GA	BLANK0000052733	104.2
No	W16EL-D	D16	LD	CP	AUGUSTA, GA	BLANK0000155482	241.3
No	W16EE-D	D16	LD	APP	AUGUSTA, GA	BLANK0000186170	255.9
No	W16EE-D	D16	LD	LIC	AUGUSTA, GA	BLANK0000179225	255.9
No	W16EL-D	D16	LD	APP	AUGUSTA, GA	BLANK0000190163	234.4
No	WRDP-LD	D16	LD	LIC	COLUMBUS, GA	BLANK0000178766	190.4
No	WRDP-LD	D16	LD	CP	COLUMBUS, GA	BLANK0000185006	174.6
No	DDW26DS-D	D16	LD	APP	LA GRANGE, GA	BLANK0000053055	246.7
No	WDMA-CD	D16	DC	LIC	MACON, GA	BLANK0000074865	157.8
No	WPXA-TV	D16	DT	LIC	ROME, GA	BLANK0000081827	342.4
No	WSAV-TV	D16	DT	LIC	SAVANNAH, GA	BLANK0000055021	194.5
No	WJPM-TV	D16	DT	LIC	FLORENCE, SC	BLANK0000138174	451.5
No	WWYA-LD	D16	LD	LIC	HONEA PATH, SC	BLANK0000093423	393.3
No	WGBP-TV	D17	DD	LIC	OPELIKA, AL	BLANK0000129713	185.6
No	WJVFLD	D17	LD	LIC	Jacksonville, FL	BLANK0000129911	170.4
No	WJVFLD	D17	LD	CP	Jacksonville, FL	BLANK0000157569	207.4
No	WFXU	D17	DT	LIC	LIVE OAK, FL	BLANK0000112143	104.4
No	W17ES-D	D17	LD	CP	ADEL, GA	BLANK0000156318	64.5
No	DW23AQ	N23-	TX	APP	LAKE CITY, FL	BLTT19931215JE	152.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D16
 Mask: Simple
 Latitude: 31 28 11.50 N (NAD83)
 Longitude: 83 14 12.30 W
 Height AMSL: 108.8 m
 HAAT: 0.0 m

Table 1 W16EK-D TVStudy Analysis of Proposal
 (page 2 of 2)



Peak ERP: 0.700 kW
 Antenna: Kathrein-750 10325 1x (ID 1009080) 230.0 deg
 Elev Pattn: Generic
 Elec Tilt: 1.00

48.9 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.004 kW	13.1 m	4.8 km
45.0	0.005	24.0	5.2
90.0	0.004	27.0	4.7
135.0	0.001	24.3	3.6
180.0	0.114	27.6	11.0
225.0	0.678	19.5	17.2
270.0	0.192	18.7	12.4
315.0	0.004	8.1	4.7

Database HAAT does not agree with computed HAAT
 Database HAAT: 0 m Computed HAAT: 20 m

Distance to Canadian border: 1135.6 km

Distance to Mexican border: 1465.8 km

Conditions at FCC monitoring station: Powder Springs GA
 Bearing: 332.8 degrees Distance: 300.1 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
 Bearing: 302.1 degrees Distance: 2195.0 km

No land mobile station failures found

Proposal is not within the Offshore Radio Service protected area

Study cell size: 1.00 km
 Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%
 Maximum new IX to LPTV: 2.00%

 Interference to proposal scenario 1
 4.86% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	W16EK-D	D16	LD	APP	LENOX, GA	W16EK-D 1002824 prop	
Undesireds:	W16EL-D	D16	LD	CP	AUGUSTA, GA	BLANK0000155482	241.3 km
	W16EE-D	D16	LD	APP	AUGUSTA, GA	BLANK0000186170	255.9
	WRDP-LD	D16	LD	LIC	COLUMBUS, GA	BLANK0000178766	190.4
	WSAV-TV	D16	DT	LIC	SAVANNAH, GA	BLANK0000055021	194.5
	Service area		Terrain-limited		IX-free	Percent IX	
	267.0	4,257	267.0	4,257	262.9	4,050	1.52 4.86
Undesired			Total IX		Unique IX	Prcnt Unique IX	
WSAV-TV	D16	DT	LIC	4.1	207	4.1	207 1.52 4.86

**Channel and
Facility
Information**

Section	Question	Response
Facility ID	186166	
State	Georgia	
City	LENOX	
LPD Channel	16	

Primary station proposed to be rebroadcast:

Facility Id	Call Sign	City	State
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**Antenna Location
Data**

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1002824
Coordinates (NAD83)	Latitude	31° 28' 11.5" N+
	Longitude	083° 14' 12.3" W-
	Structure Type	GTOWER-Guyed Structure Used for Communication Purposes
	Overall Structure Height	151.4 meters
	Support Structure Height	151.2 meters
	Ground Elevation (AMSL)	96.6 meters
Antenna Data	Height of Radiation Center Above Ground Level	12.2 meters
	Height of Radiation Center Above Mean Sea Level	108.8 meters
	Effective Radiated Power	0.7 kW

**Antenna
Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Directional Custom
	Do you have an Antenna ID?	Yes
	Antenna ID	1009080
Antenna Manufacturer and Model	Manufacturer:	Kathrein
	Model	750 10325 1x
	Rotation	230 degrees
	Electrical Beam Tilt	Not Applicable
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	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?	No
	Uploaded file for elevation antenna (or radiation) pattern data	
	Out-of-Channel Emission Mask:	Simple

Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	Value	Degree	Value	Degree	Value	Degree	Value
0	1.000	90	0.048	180	0.090	270	0.056
10	0.953	100	0.029	190	0.079	280	0.107
20	0.838	110	0.046	200	0.063	290	0.179
30	0.685	120	0.066	210	0.062	300	0.277
40	0.524	130	0.075	220	0.072	310	0.404
50	0.376	140	0.070	230	0.074	320	0.556
60	0.255	150	0.060	240	0.063	330	0.719
70	0.163	160	0.066	250	0.042	340	0.866
80	0.095	170	0.083	260	0.029	350	0.968

Additional Azimuths

Degree	V _A
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