

## **ENGINEERING EXHIBIT**

### **Application for Digital Television Station Construction Permit**

prepared for

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

WVUE-DT New Orleans, LA

Facility ID 4149

Ch. 29 1000 kW 291 m

*Gray Television Licensee, LLC* (“Gray”) is the licensee of digital television station WVUE-DT, Channel 29, Facility ID 4149, New Orleans LA. WVUE-DT is licensed (file# BLCDDT-20110502AEC) to operate with 850 kW effective radiated power (“ERP”) directional at 290 meters antenna height above average terrain (“HAAT”). *Gray* proposes herein to increase the ERP to 1000 kW and update the HAAT to 291 meters.<sup>1</sup>

WVUE-DT will continue to employ the existing transmitting antenna utilized by the licensed WVUE-DT facility. The antenna is top-mounted on a tower structure which corresponds to FCC Antenna Structure Registration number 1022410. No change to the overall structure height will result.

The antenna is an elliptically polarized directional Alive Telecommunications model ATC-BCE326CX-29 (20 percent vertical polarization). The maximum horizontally polarized ERP is 1000 kW and the maximum vertically polarized ERP is 200 kW. The vertically polarized component will not exceed the horizontally polarized component at any azimuth. The directional antenna’s azimuthal pattern is supplied in Figure 1 and the elevation pattern is depicted in Figure 2.

Figure 3 supplies a map that demonstrates compliance with §73.625(a)(1) regarding coverage of the entire principal community. The proposed facility’s predicted population exceeds 95 percent of the baseline facility’s population as described in the *Incentive Auction Closing and Channel Reassignment Public Notice* (“CCRPN”, DA 17-317, released April 13, 2017).

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<sup>1</sup>The antenna height above ground and above mean sea level are unchanged from licensed values. The antenna HAAT is recalculated to be 291.1 meters, based on FCC 30 meter terrain data developed by OET.

The proposed facility expands the WVUE-DT service contour beyond that established by the *CCRPN*. Interference study per FCC OET Bulletin 69<sup>2</sup> shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby full service and Class A television stations as required by §73.616. The interference study output report is provided as Table 1.

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

The proposed 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 considering 10 percent antenna relative field in downward elevations (pattern data shows less than 10 percent relative field at angles 10 to 90 degrees below the antenna), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is  $4.8 \mu\text{W}/\text{cm}^2$ , which is 1.3 percent of the general population/uncontrolled maximum permitted exposure limit. 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.

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 exhibit is limited to the evaluation of exposure to RF electromagnetic field.

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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"). This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 2 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.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Antenna Elevation Pattern
Figure 3	Proposed Coverage Contours
Table 1	TVStudy Analysis of Proposal
Form 2100	Saved Version of Engineering Sections from FCC Form at Time of Upload

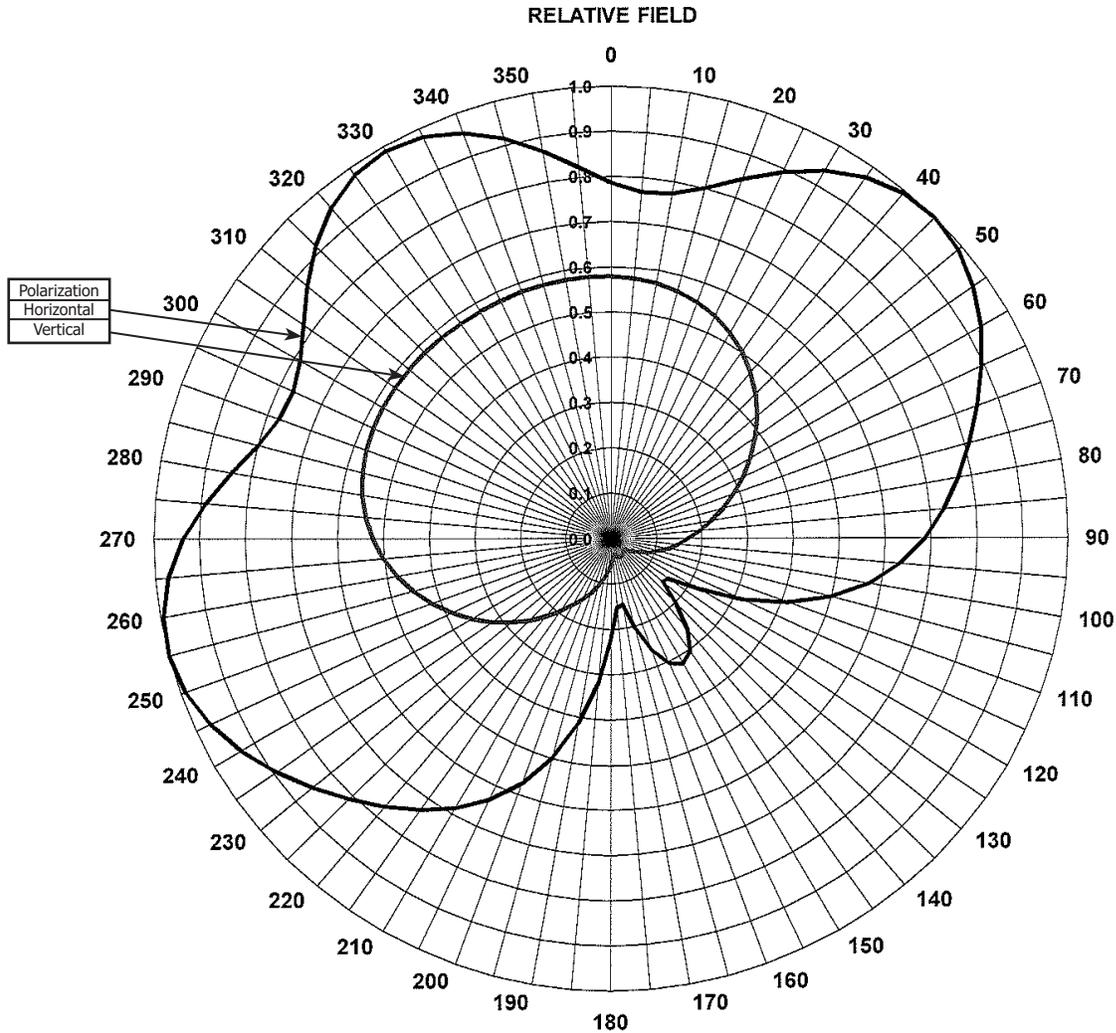
**Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E.	November 25, 2020	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

**AZIMUTH PATTERN**



TYPE:	ATC-BCE326CX-29	
	Numeric	dB
Directivity:	1.76	2.46
Polarization:	Elliptical	
Channel:	29	
Location:	New Orleans	



**Figure 1**  
**Antenna Azimuthal Pattern**  
**WVUE-DT New Orleans, LA**  
**Facility ID 4149**  
**Ch. 29 1000 kW 291 m**

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prepared for  
**Gray Television Licensee, LLC**

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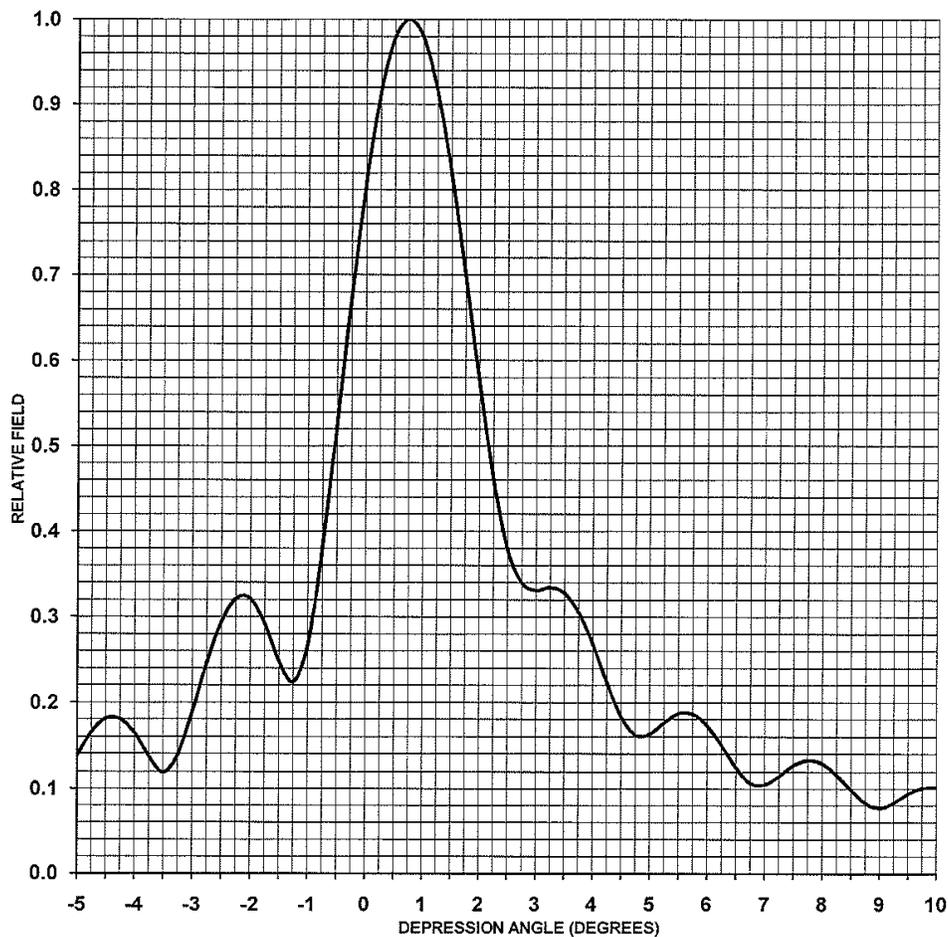
November, 2020

**ELEVATION PATTERN**



TYPE: ATC-BCE326CX-29

Directivity:	Numeric	dBd
Main Lobe:	26.40	14.2
Horizontal:	17.29	12.4
Beam Tilt:	0.75	
Polarization:	Elliptical	
Channel:	29	
Location:	New Orleans	



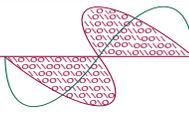
**Figure 2**  
**Antenna Elevation Pattern**  
**WVUE-DT New Orleans, LA**  
**Facility ID 4149**  
**Ch. 29 1000 kW 291 m**

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prepared for  
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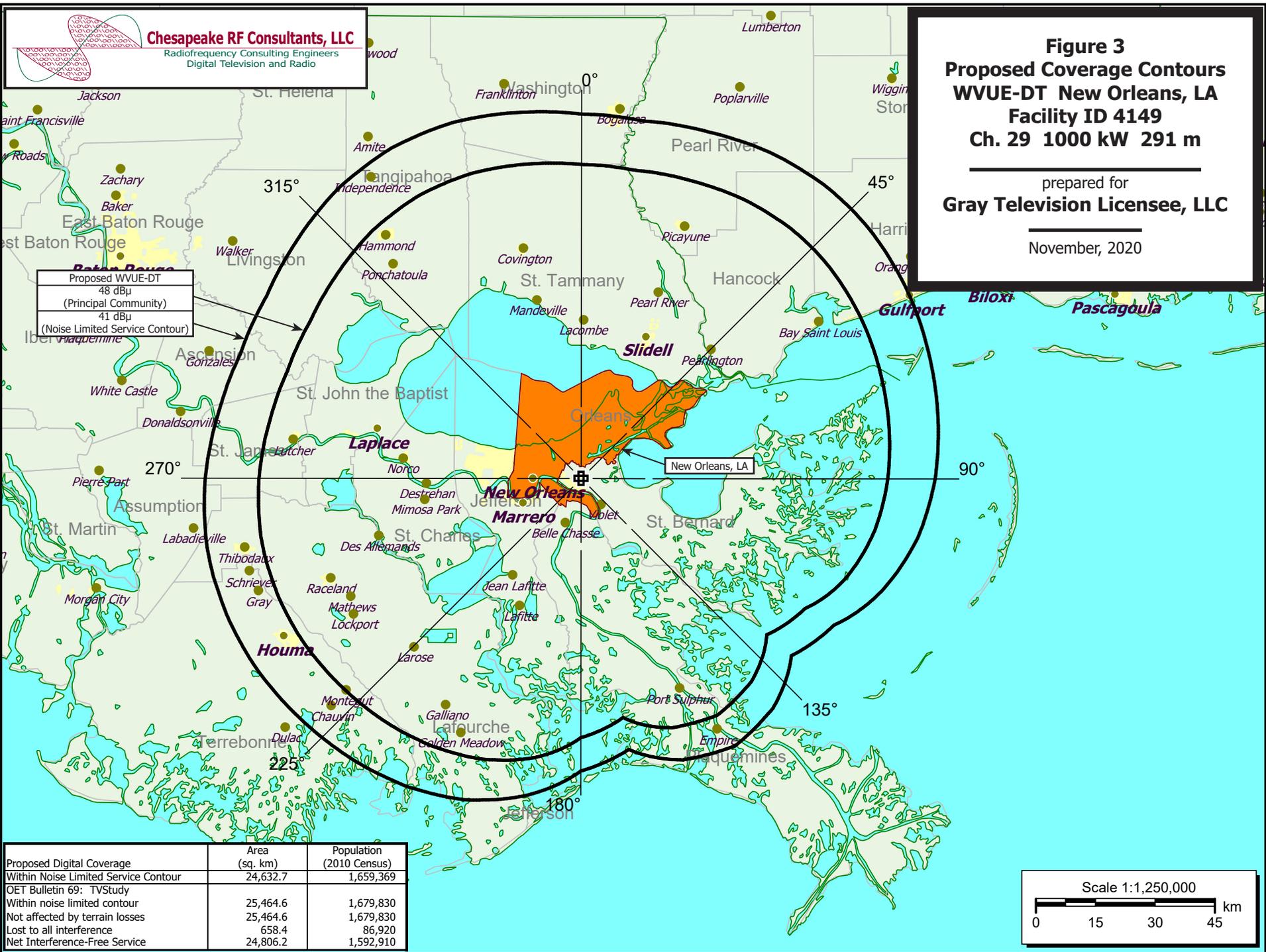
November, 2020



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

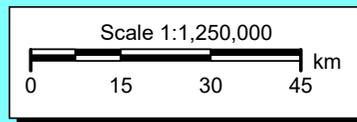
**Figure 3**  
**Proposed Coverage Contours**  
**WVUE-DT New Orleans, LA**  
**Facility ID 4149**  
**Ch. 29 1000 kW 291 m**

prepared for  
**Gray Television Licensee, LLC**  
 November, 2020



Proposed WVUE-DT  
 48 dBμ  
 (Principal Community)  
 41 dBμ  
 (Noise Limited Service Contour)

Proposed Digital Coverage	Area (sq. km)	Population (2010 Census)
Within Noise Limited Service Contour	24,632.7	1,659,369
OET Bulletin 69: TVStudy		
Within noise limited contour	25,464.6	1,679,830
Not affected by terrain losses	25,464.6	1,679,830
Lost to all interference	658.4	86,920
Net Interference-Free Service	24,806.2	1,592,910



**Table 1 WVUE-DT TVStudy Analysis of Proposal**  
 (page 1 of 2)



tvstudy v2.2.5 (4uoc83)  
 Database: localhost, Study: WVUE-DT prop 1000kW, Model: Longley-Rice  
 Start: 2020.11.25 13:59:40

Study created: 2020.11.25 13:59:40

Study build station data: LMS TV 2020-11-23

Proposal: WVUE-DT D29 DT APP NEW ORLEANS, LA  
 File number: WVUE-DT prop 1000kW  
 Facility ID: 4149  
 Station data: User record  
 Record ID: 3348  
 Country: U.S.  
 Zone: III

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	KATC	D28	DT	LIC	LAFAYETTE, LA	BLCDT20071109AAV	228.7 km
No	WMAW-TV	D28	DT	LIC	MERIDIAN, MS	BLANK0000106235	256.1
Yes	WFBD	D29	DT	CP	DESTIN, FL	BLANK0000027353	330.4
No	KITU-TV	D29	DT	LIC	BEAUMONT, TX	BLANK0000063643	381.5
No	WEIQ	D30	DT	LIC	MOBILE, AL	BLANK0000111746	212.4
No	WLFT-CD	D30	DC	LIC	BATON ROUGE, LA	BLDTA20110912ACB	116.3
No	KFOL-CD	D30	DC	LIC	HOUMA, LA	BLDTA20100111AGW	81.6
No	WLBT	D30	DT	LIC	JACKSON, MS	BLCDT20100119AEE	254.5

No non-directional AM stations found within 0.8 km

Directional AM stations within 3.2 km:  
 WQNO 690 L DAN D NEW ORLEANS, LA BMML20170703AFC  
 WQNO 690 L DAN N NEW ORLEANS, LA BMML20170703AFC

Record parameters as studied:

Channel: D29  
 Latitude: 29 57 14.90 N (NAD83)  
 Longitude: 89 56 58.30 W  
 Height AMSL: 291.2 m  
 HAAT: 291.1 m  
 Peak ERP: 1000 kW  
 Antenna: ATC-ATC-BCE326CX-29 (ID 105376) 330.0 deg  
 Elev Pattn: Generic  
 Elec Tilt: 0.75

40.2 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	618 kW	292.2 m	93.0 km
45.0	1000	291.2	97.4
90.0	471	291.1	90.2
135.0	42.2	290.9	73.7
180.0	50.2	291.0	74.7
225.0	659	291.4	93.5
270.0	878	289.9	96.0
315.0	830	291.2	95.6

Distance to Canadian border: 1457.0 km

Distance to Mexican border: 814.8 km

Conditions at FCC monitoring station: Powder Springs GA  
 Bearing: 47.3 degrees Distance: 656.9 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
 Bearing: 313.3 degrees Distance: 1786.8 km

**Table 1 WVUE-DT TVStudy Analysis of Proposal**  
(page 2 of 2)



Study cell size: 2.00 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%

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Interference to BLANK0000027353 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance			
	WFBD	D29	DT	CP	DESTIN, FL	BLANK0000027353				
Undesireds:	WVUE-DT	D29	DT	BL	NEW ORLEANS, LA	DTVBL4149	330.4 km			
	WVUE-DT	D29	DT	APP	NEW ORLEANS, LA	WVUE-DT prop 1000kW	330.4			
	WFSG	D28	DT	LIC	PANAMA CITY, FL	BLANK0000064507	103.4			
	WBRC	D29	DT	LIC	BIRMINGHAM, AL	BLANK0000081282	277.0			
	WGIQ	D30	DT	LIC	LOUISVILLE, AL	BLANK0000067031	146.0			
	WEIQ	D30	DT	LIC	MOBILE, AL	BLANK0000111746	118.0			
	Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX					
	24806.7	817,914	24663.7	817,377	24104.3	813,682	24096.4	813,431	0.03	0.03
Undesired			Total IX	Unique IX, before	Unique IX, after					
WVUE-DT D29 DT BL		63.7	100	27.8	47					
WVUE-DT D29 DT APP		71.6	351			35.8	298			
WFSG D28 DT LIC		200.3	2,300	200.3	2,300	200.3	2,300			
WBRC D29 DT LIC		115.5	307	99.6	263	99.6	263			
WEIQ D30 DT LIC		215.7	1,041	195.7	1,032	195.7	1,032			

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Interference to proposal scenario 1  
5.17% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance	
	WVUE-DT	D29	DT	APP	NEW ORLEANS, LA	WVUE-DT prop 1000kW		
Undesireds:	WFBD	D29	DT	CP	DESTIN, FL	BLANK0000027353	330.4 km	
	WLFT-CD	D30	DC	LIC	BATON ROUGE, LA	BLDTA20110912ACB	116.3	
	KFOL-CD	D30	DC	LIC	HOUMA, LA	BLDTA20100111AGW	81.6	
	Service area	Terrain-limited	IX-free	Percent IX				
	25464.6	1,679,830	25464.6	1,679,830	24806.2	1,592,910	2.59	5.17
Undesired			Total IX	Unique IX	Prcnt Unique IX			
WFBD D29 DT CP		4.0	130	4.0	130	0.02	0.01	
WLFT-CD D30 DC LIC		64.2	6,492	64.2	6,492	0.25	0.39	
KFOL-CD D30 DC LIC		590.2	80,298	590.2	80,298	2.32	4.78	

**Channel and Facility Information**

Section	Question	Response
<b>Proposed Community of License</b>	Facility ID	4149
	State	Louisiana
	City	NEW ORLEANS
	DTV Channel	29
	Designated Market Area	NEW ORLEANS
<b>Facility Type</b>	Facility Type	Commercial
	Station Type	Main
<b>Zone</b>	Zone	3

**Antenna Location Data**

Section	Question	Response
<b>Antenna Structure Registration</b>	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1022410
<b>Coordinates (NAD83)</b>	Latitude	29° 57' 14.9" N+
	Longitude	089° 56' 58.3" W-
	Structure Type	GTOWER-Guyed Structure Used for Communication Purposes
	Overall Structure Height	298.7 meters
	Support Structure Height	282.5 meters
	Ground Elevation (AMSL)	0.9 meters
<b>Antenna Data</b>	Height of Radiation Center Above Ground Level	290.3 meters
	Height of Radiation Center Above Average Terrain	291.1 meters
	Height of Radiation Center Above Mean Sea Level	291.2 meters
	Effective Radiated Power	1000 kW

**Antenna  
Technical Data**

Section	Question	Response
<b>Antenna Type</b>	Antenna Type	Directional Custom
	Do you have an Antenna ID?	Yes
	Antenna ID	105376
<b>Antenna Manufacturer and Model</b>	Manufacturer:	ATC
	Model	ATC-BCE326CX-29
	Rotation	330 degrees
	Electrical Beam Tilt	0.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Elliptical
<b>DTV and DTS: Elevation Pattern</b>	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	

**Directional Antenna Relative Field Values (Pre-rotated Pattern)**

Degree	Value	Degree	Value	Degree	Value	Degree	Value
0	0.989	90	0.933	180	0.319	270	0.933
10	0.954	100	0.852	190	0.262	280	0.99
20	0.868	110	0.77	200	0.149	290	0.994
30	0.786	120	0.686	210	0.224	300	0.937
40	0.773	130	0.573	220	0.413	310	0.843
50	0.843	140	0.413	230	0.573	320	0.773
60	0.937	150	0.224	240	0.686	330	0.786
70	0.994	160	0.149	250	0.771	340	0.868
80	0.99	170	0.262	260	0.852	350	0.954

**Additional Azimuths**

Degree	V <sub>A</sub>
75	1
285	1

**Construction  
Permit  
Certifications**

Section	Question	Response
<b>Post-Incentive Auction Expedited Processing</b>	It will operate on the DTV channel for this station as established in the post-incentive auction channel reassignment public notice.	Yes
	It will operate post-incentive auction facilities that do not expand the noise-limited service contour in any direction beyond that established by the post-incentive auction channel reassignment public notice.	No
	It will operate post-incentive auction facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the post-incentive auction channel reassignment public notice.	Yes
	The antenna structure to be used by this facility has been registered by the Commission and will not require re-registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely affect safety in air navigation and this structure qualifies for later registration under the Commission's phased registration plan, OR the proposed installation on this structure does not require notification to the FAA pursuant to 47 C.F.R. Section 17.7.	Yes
<b>Environmental Effect</b>	Would a Commission grant of Authorization for this location be an action which may have a significant environmental effect? (See 47 C.F.R. Section 1.1306)	No
<b>Broadcast Facility</b>	The proposed facility complies with the applicable engineering standards and assignment requirements of 47 C.F.R. Sections 73.616, 73.622(i), 73.623(e), 73.625, 73.1030, and 73.1125.	Yes