

## **ENGINEERING EXHIBIT**

### **Digital Low Power Television Station Application for Minor Modification of Licensed Facility** prepared for

**Gray Television Licensee, LLC**  
W14EZ-D Myrtle Beach, SC  
Facility ID 185604  
Ch. 14 15 kW Nondirectional

*Gray Television Licensee, LLC* (“Gray”) is the licensee of digital Low Power Television station W14EZ-D, Channel 14, Facility ID 185604, Myrtle Beach, SC. W14EZ-D is licensed to operate at 0.2 kW effective radiated power (“ERP”) with a directional antenna (file# 0000194108). *Gray* herein seeks a minor modification Construction Permit to utilize a nondirectional antenna at increased ERP and antenna height.

No change in site location is proposed. The proposed facility will employ a new antenna system to be side-mounted on the tower structure associated with FCC Antenna Structure Registration number 1256984. No change to the overall structure height is proposed.

The proposed antenna is a Dielectric model TLP-12A/VP-R having elliptical polarization. The proposed ERP is 15 kW horizontally polarized and 4.5 kW vertically polarized using a “full service” out of channel emission mask.

Figure 1 depicts the 51 dB $\mu$  coverage contour of the proposed and licensed facilities, demonstrating compliance with §73.3572 for a minor change. Since the proposed 51 dB $\mu$  contour encompasses that of the licensed facility, no service loss area will be created. Considerable service improvement will result as the population within the 51 dB $\mu$  contour increases to 328,301 persons (2010 census), which is a 134-fold increase beyond the 2,455 persons within the licensed W14EZ-D facility’s 51 dB $\mu$  contour.

Interference study per OET Bulletin 69<sup>1</sup> shows that the proposal complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations. FCC processing of this proposal is requested using a 1.0 km cell size and 0.2 km terrain profile increment. 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 RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10) and 20 percent antenna relative field in downward elevations (pattern data shows 20 percent or less relative field at angles 10 to 90 degrees below the antenna), the calculated power density attributable to the proposed facility at locations near the transmitter site at a height of two meters above ground level is  $1.1 \mu\text{W}/\text{cm}^2$ , which is 0.3 percent of the general population / uncontrolled maximum permissible 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. No increase in structure height is proposed.

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<sup>1</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, 1 km cell size, and 0.2 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.

**Engineering Exhibit**  
**Gray Television Licensee, LLC (W14EZ-D)**  
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*List of Attachments*

Figure 1	Coverage Contour Comparison
Table 1	TVStudy Analysis of Proposal
Form 2100	Saved Version of Engineering Sections of FCC Form at Time of Upload

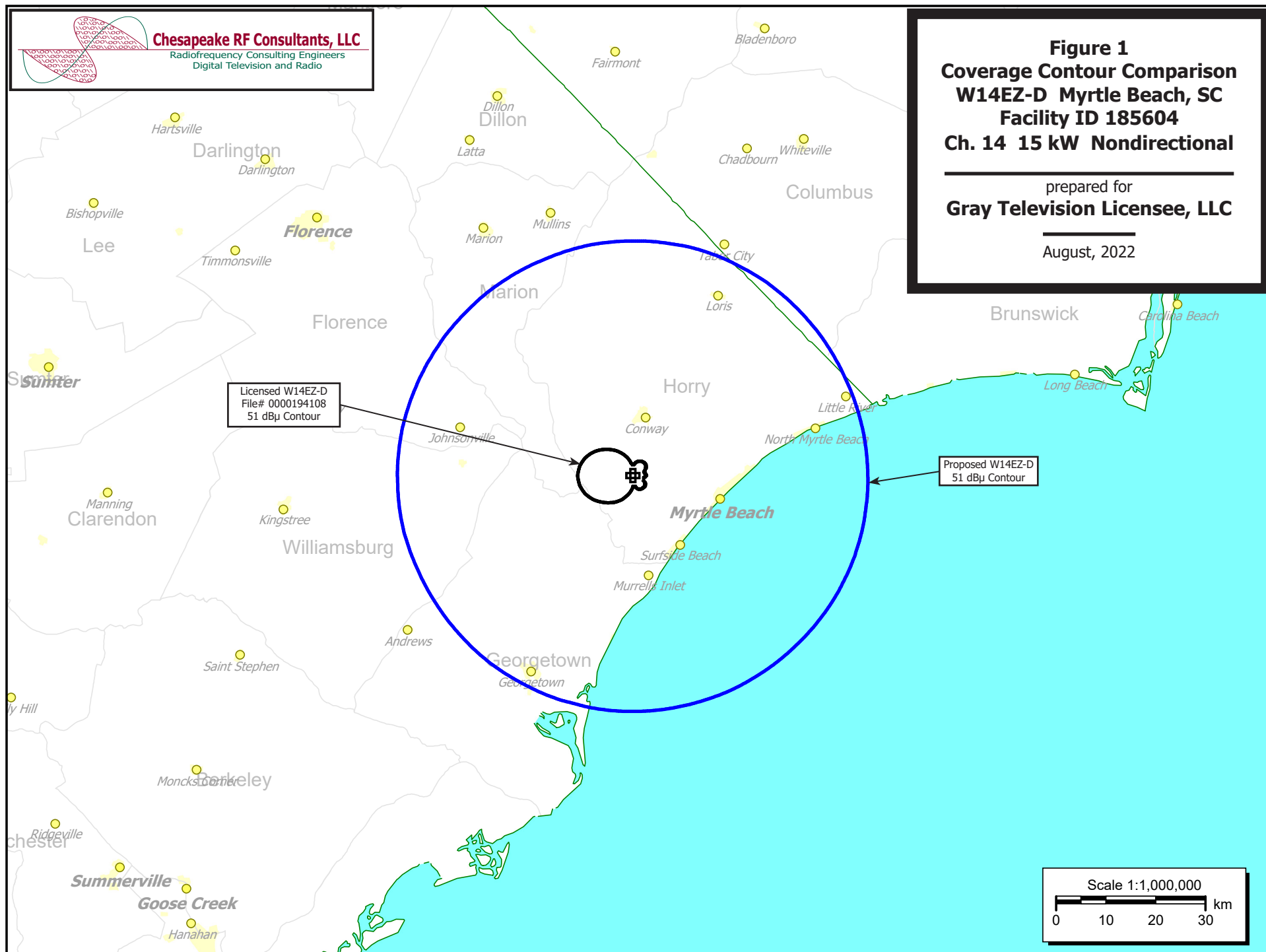
**Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E.	August 26, 2022	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



prepared for  
**Gray Television Licensee, LLC**

August, 2022



# **Table 1 W14EZ-D TVStudy Analysis of Proposal** (page 1 of 3)



tvstudy v2.2.5 (4uoc83)  
Database: localhost, Study: W14EZ-D 1256984 prop 1.0-0.2, Model: Longley-Rice  
Start: 2022.08.25 13:41:38

Study created: 2022.08.25 13:41:38

Study build station data: LMS TV 2022-08-24

Proposal: W14EZ-D D14 LD APP Myrtle Beach, SC  
File number: W14EZ-D 1256984 prop  
Facility ID: 185604  
Station data: User record  
Record ID: 4610  
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	WFOX-TV	D14	DT	LIC	JACKSONVILLE, FL	BLANK0000120746	449.7 km
No	W31FE-D	N14+	TX	LIC	Savannah, GA	BLTT20040915ADW	361.0
Yes	WRDC	D14	DT	LIC	DURHAM, NC	BLANK0000125503	221.8
Yes	WHKY-TV	D14	DD	LIC	HICKORY, NC	BLANK0000109333	273.4
No	WSCG-LD	D14+	LD	LIC	BEAUFORT, ETC., SC	BLANK0000063818	214.2
No	WLFQ	D14	DD	LIC	GRUNDY, VA	BLANK0000071597	439.2
No	WNLO-CD	D14	DC	LIC	NORFOLK, VA	BLANK0000125110	414.8
No	WRAZ	D15	DT	LIC	RALEIGH, NC	BLANK0000143683	221.8
No	WILM-LD	D15	LD	LIC	WILMINGTON, NC	BLANK0000055240	102.0
No	WLTX	D15	DT	LIC	COLUMBIA, SC	BLANK0000082085	161.0
No	W15DC-D	D15	LD	LIC	FLORENCE, SC	BLANK0000178761	82.4
No	W15DC-D	D15	LD	CP	FLORENCE, SC	BLANK0000185135	74.6
Yes	W15ES-D	D15	LD	LIC	MYRTLE BEACH, SC	BLANK0000194110	15.7

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D14  
Mask: Full Service  
Latitude: 33 43 50.90 N (NAD83)  
Longitude: 79 4 31.40 W  
Height AMSL: 162.8 m  
HAAT: 0.0 m  
Peak ERP: 15.0 kW  
Antenna: Omnidirectional  
Elev Pattn: Generic  
Elec Tilt: 0.50

48.7 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	15.0 kW	155.0 m	49.7 km
45.0	15.0	153.6	49.6
90.0	15.0	154.9	49.7
135.0	15.0	156.4	49.8
180.0	15.0	157.4	49.9
225.0	15.0	156.4	49.8
270.0	15.0	157.8	49.9
315.0	15.0	152.7	49.5

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m Computed HAAT: 156 m

Distance to Canadian border: 930.0 km

Distance to Mexican border: 1920.6 km

**Table 1 W14EZ-D TVStudy Analysis of Proposal**  
(page 2 of 3)



Conditions at FCC monitoring station: Powder Springs GA  
Bearing: 273.2 degrees Distance: 521.9 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 294.7 degrees Distance: 2419.5 km

No land mobile station failures found

Study cell size: 1.00 km  
Profile point spacing: 0.20 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 BLANK0000125503 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WRDC	D14	DT	LIC	DURHAM, NC	BLANK0000125503	
Undesireds:	W14EZ-D	D14	LD	APP	Myrtle Beach, SC	W14EZ-D 1256984 prop	221.8 km
	WHKY-TV	D14	DD	LIC	HICKORY, NC	BLANK0000109333	238.6
	WLFG	D14	DD	LIC	GRUNDY, VA	BLANK0000071597	343.2
	WNLO-CD	D14	DC	LIC	NORFOLK, VA	BLANK0000125110	221.1
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
51071.2 3,976,201		50793.0 3,969,013		49644.8 3,870,207		49638.8 3,870,135	0.01 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
W14EZ-D D14 LD APP		17.0 200				6.0 72	
WHKY-TV D14 DD LIC		1067.8 97,102		998.7 93,296		990.7 93,207	
WLFG D14 DD LIC		75.2 3,945		9.0 152		9.0 152	
WNLO-CD D14 DC LIC		76.3 1,570		71.3 1,552		71.3 1,552	

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Interference to BLANK0000109333 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WHKY-TV	D14	DD	LIC	HICKORY, NC	BLANK0000109333	
Undesireds:	W14EZ-D	D14	LD	APP	Myrtle Beach, SC	W14EZ-D 1256984 prop	273.4 km
	WRDC	D14	DT	LIC	DURHAM, NC	BLANK0000125503	238.6
	WLFG	D14	DD	LIC	GRUNDY, VA	BLANK0000071597	169.8
	WLTX	D15	DT	LIC	COLUMBIA, SC	BLANK0000082085	159.5
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
31184.8 3,357,082		30117.2 3,305,694		28866.1 3,257,850		28866.1 3,257,850	0.00 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
W14EZ-D D14 LD APP		5.0 176				0.0 0	
WRDC D14 DT LIC		927.8 36,279		760.6 30,970		758.6 30,849	
WLFG D14 DD LIC		490.5 16,874		322.3 11,565		321.3 11,565	
WLTX D15 DT LIC		1.0 0		0.0 0		0.0 0	

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Interference to BLANK0000194110 LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W15ES-D	D15	LD	LIC	MYRTLE BEACH, SC	BLANK0000194110	
Undesireds:	W14EZ-D	D14	LD	APP	Myrtle Beach, SC	W14EZ-D 1256984 prop	15.7 km
	WDDZ-LD	D15	LD	CP	AUGUSTA, GA	BLANK0000159534	261.8
	WRAZ	D15	DT	LIC	RALEIGH, NC	BLANK0000143683	236.5
	WILM-LD	D15	LD	LIC	WILMINGTON, NC	BLANK0000055240	110.9
	W15DC-D	D15	LD	LIC	FLORENCE, SC	BLANK0000178761	98.0
	W15DO-D	D15	LD	LIC	NORFOLK, VA	BLANK0000120726	307.6
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
139.7 35,324		139.7 35,324		137.8 34,961		132.8 34,345	3.60 1.76

**Table 1 W14EZ-D TVStudy Analysis of Proposal**  
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Undesired		Total IX	Unique IX, before	Unique IX, after
W14EZ-D D14 LD APP	5.9	649		5.0 616
WRAZ D15 DT LIC	1.0	33	1.0 33	0.0 0
WILM-LD D15 LD LIC	1.0	330	1.0 330	1.0 330

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Interference to proposal scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W14EZ-D	D14	LD	APP	Myrtle Beach, SC	W14EZ-D 1256984 prop	
Undesireds:	W15DC-D	D15	LD	LIC	FLORENCE, SC	BLANK0000178761	82.4 km
	Service area			Terrain-limited		IX-free	Percent IX
	7776.8 343,792			7776.8 343,792	7776.8	343,792	0.00 0.00

**Channel and  
Facility  
Information**

Section	Question	Response
Facility ID	185604	
State	South Carolina	
City	MYRTLE BEACH	
LPD Channel	14	



## Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1256984
Coordinates (NAD83)	Latitude	33° 43' 50.9" N+
	Longitude	079° 04' 31.4" W-
	Structure Type	GTOWER-Guyed Structure Used for Communication Purposes
	Overall Structure Height	192.0 meters
	Support Structure Height	177.4 meters
	Ground Elevation (AMSL)	5.8 meters
Antenna Data	Height of Radiation Center Above Ground Level	157.0 meters
	Height of Radiation Center Above Mean Sea Level	162.8 meters
	Effective Radiated Power	15 kW

**Antenna  
Technical Data**

Section	Question	Response
<b>Antenna Type</b>	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	
<b>Antenna Manufacturer and Model</b>	Manufacturer:	Dielectric
	Model	TLP-12A/VP-R
	Rotation	
	Electrical Beam Tilt	0.5
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Elliptical
<b>Elevation Radiation 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	
	Out-of-Channel Emission Mask:	Full Service