

ENGINEERING EXHIBIT

Displacement Application of Digital Low Power Television Station Construction Permit

prepared for

Gray Television Licensee, LLC

W19DO-D Augusta, GA

Facility ID 185708

Ch. 24 0.2 kW Directional

Gray Television Licensee, LLC (“Gray”) is the permittee of unbuilt digital Low Power Television station W19DO-D, Channel 19, Augusta GA, Facility ID 185708. W19DO-D is currently authorized to operate pursuant to a Construction Permit (“CP”, file# BNPDTL-20100421ABO) with 2 kW effective radiated power (“ERP”), directional. The authorized Channel 19 facility is displaced by a Class A television station that was reassigned to a new channel. *Gray* herein seeks a displacement CP to change to Channel 24 and to utilize a different transmitting location.

The existing Channel 19 CP is displaced due to interference caused to and received from WBPI-CD (Facility ID 17464, Augusta GA, 30.4 km distant). WBPI-CD was reassigned to Channel 19 at the incentive auction¹ and is now licensed on Channel 19. Table 1 supplies a summary of the interference between WBPI-CD and the W19DO-D CP, showing that W19DO-D would cause 7.04 percent interference to WBPI-CD and experience 58.68 percent interference from WBPI-CD.

As proposed herein, the proposed Channel 24 facility will employ an antenna to the side-mounted on the tower structure associated with FCC Antenna Structure Registration number 1277199. No change to the overall structure height will result. The site is located more than 75 miles (121 km) from the reference coordinates of the markets listed in Appendix A of

¹*Incentive Auction Closing and Channel Reassignment Public Notice*, DA 17-317, released April 13, 2017.

DA 09-1487² and is 8.8 km (5.5 miles) from the W19DO-D CP site. The current CP site is the location originally authorized for W19DO-D.

The proposed antenna is an ELTI single UHF panel having horizontal polarization. The proposed ERP is 0.2 kW 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 dBμ coverage contour of the proposed facility as well as that of the current (original) CP facility, demonstrating compliance with §73.3572 for a minor change.

Interference study per OET Bulletin 69³ 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 2, 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 40 percent antenna relative field in downward elevations (pattern data shows 40 percent or less relative field at angles 30 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 63.6 μW/cm², which is 17.9 percent of the general population / uncontrolled maximum permissible exposure limit. No other emitters are known that would be considered a significant contributor in the vicinity of the site.

²“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.

³FCC 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 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.

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.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Table 1	Ch. 19 TVStudy Displacement Summary
Table 2	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.	June 29, 2022	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

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

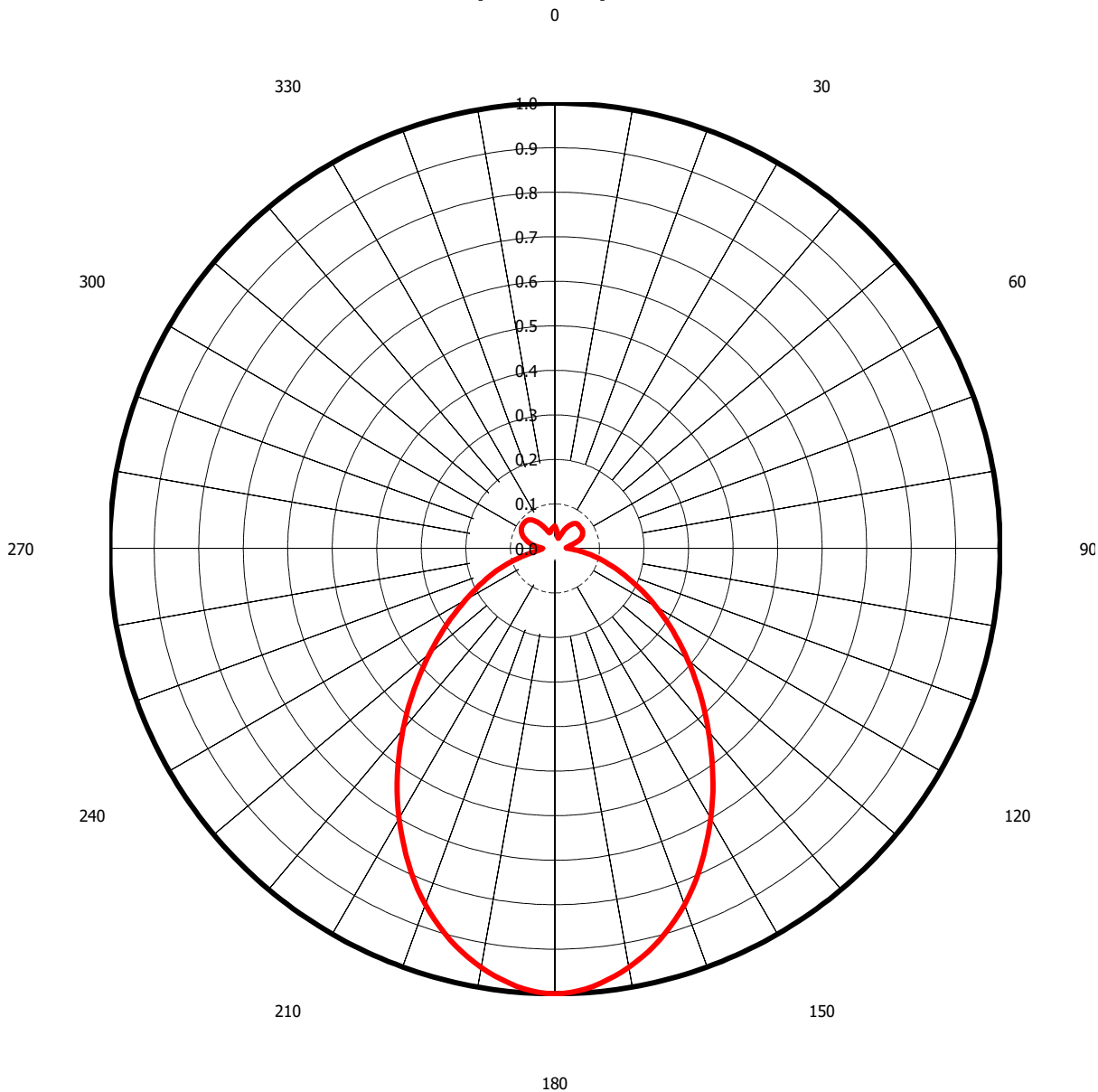


Figure 1
Antenna Azimuthal Pattern
W19DO-D Augusta, GA
Facility ID 185708
Ch. 24 0.2 kW Directional

prepared for
Gray Television Licensee, LLC

June, 2022



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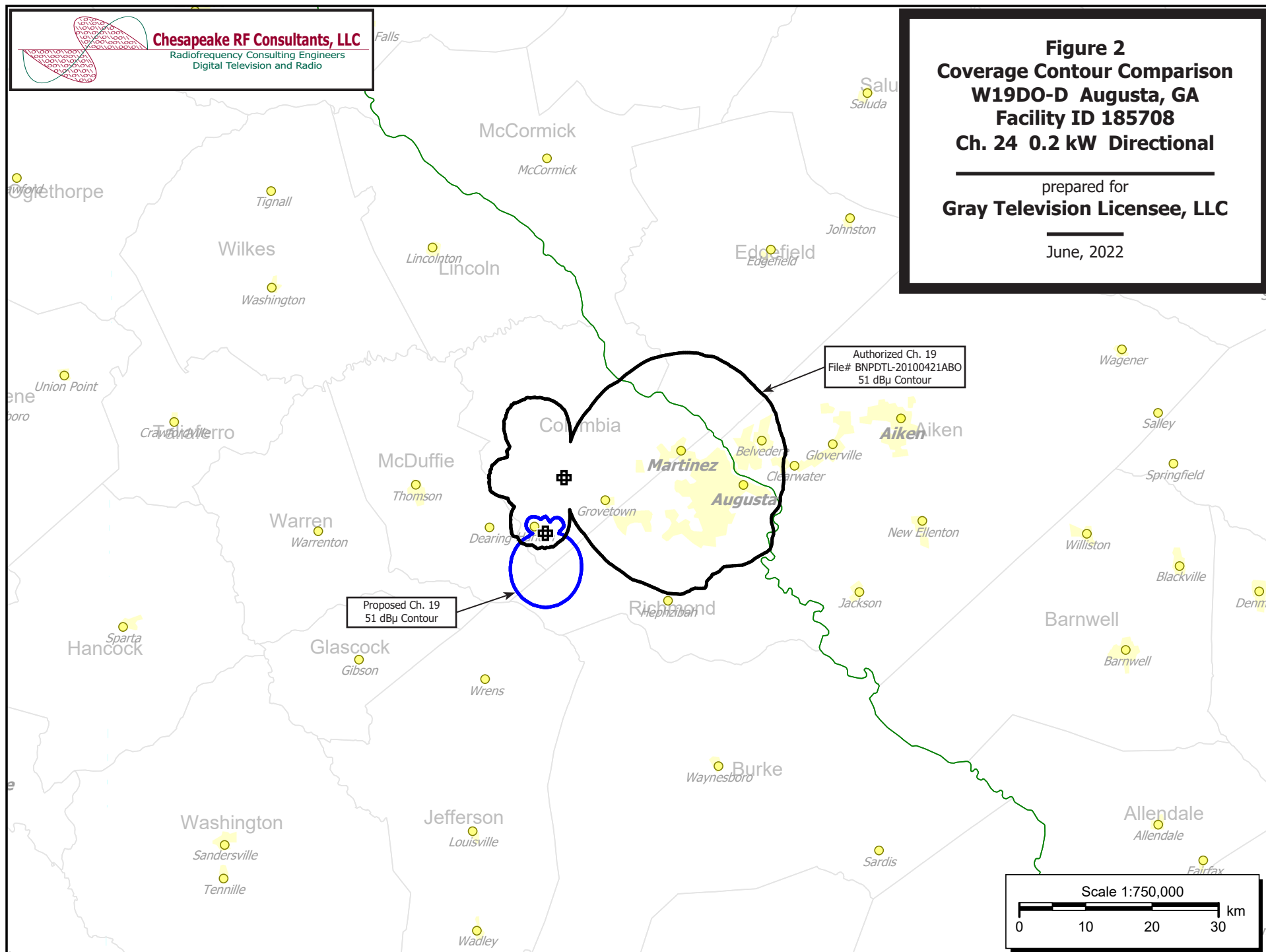


Table 1 W19DO-D Ch. 19 TVStudy Displacement Summary
(page 1 of 1)

Interference caused to WBPI-CD Repack Ch. 19 Augusta, GA

Interference to BLANK0000059661 LIC scenario 1

****IX: 7.04% interference caused**

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WBPI-CD	D19	DC	LIC	AUGUSTA, GA	BLANK0000059661	
Undesireds:	W19DO-D	D19	LD	CP	AUGUSTA, GA	BNPDTL20100421ABO	30.4 km
	WGCL-TV	D19	DT	LIC	ATLANTA, GA	BLANK0000152289	224.4
	WSOC-TV	D19	DT	LIC	CHARLOTTE, NC	BLANK0000146857	223.7
	WCSC-TV	D19	DT	LIC	CHARLESTON, SC	BLANK0000184937	218.4
	WKPZ-CD	D19	DC	LIC	KINGSPORT, TN	BLANK0000001584	339.9
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
8849.7	561,875	8821.9	561,725	8692.2	560,220	8218.6	520,801
						5.45	7.04
Undesired				Total IX	Unique IX, before	Unique IX, after	
W19DO-D	D19	LD	CP	510.3	40,168	473.6	39,419
WGCL-TV	D19	DT	LIC	58.5	922	16.9	78
WSOC-TV	D19	DT	LIC	79.1	617	55.3	399
WCSC-TV	D19	DT	LIC	33.7	978	3.0	10

Interference received from WBPI-CD Repack Ch. 19 Augusta, GA

Interference to proposal scenario 1

73.27% interference received

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W19DO-D	D19	LD	CP	AUGUSTA, GA	BNPDTL20100421ABO	
Undesireds:	WIEF-LD	D18	LD	LIC	AUGUSTA, GA	BLANK0000096704	40.1 km
	WGCL-TV	D19	DT	LIC	ATLANTA, GA	BLANK0000152289	195.3
	WBPI-CD	D19	DC	LIC	AUGUSTA, GA	BLANK0000059661	30.4
	W19DW-D	D19	LD	LIC	COLUMBUS, GA	BLANK0000158115	278.2
	WSOC-TV	D19	DT	LIC	CHARLOTTE, NC	BLANK0000146857	243.1
	WCSC-TV	D19	DT	LIC	CHARLESTON, SC	BLANK0000184937	246.5
	W20EW-D	D20	LD	CP	AUGUSTA, GA	BLANK0000190161	21.4
Service area		Terrain-limited			IX-free	Percent IX	
1300.8	352,849	1257.2	341,959		349.3	91,414	72.22 73.27
Undesired				Total IX		Unique IX	Prcnt Unique IX
WIEF-LD	D18	LD	LIC	100.3	27,575	0.0	0.00 0.00
WGCL-TV	D19	DT	LIC	164.8	42,988	6.9	3,153 0.55 0.92
WBPI-CD	D19	DC	LIC	898.0	246,290	733.1	200,653 58.32 58.68
WSOC-TV	D19	DT	LIC	13.9	7,533	0.0	0 0.00 0.00
WCSC-TV	D19	DT	LIC	10.9	9,157	0.0	0 0.00 0.00
W20EW-D	D20	LD	CP	1.0	721	1.0	721 0.08 0.21

Table 2 W19DO-D Ch. 24 TVStudy Analysis of Proposal
(page 1 of 3)



tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: W19DO-D 24 1277199, Model: Longley-Rice
Start: 2022.06.29 15:48:59

Study created: 2022.06.29 15:48:59

Study build station data: LMS TV 2022-06-29

Proposal: W19DO-D D24 LD APP AUGUSTA, GA
File number: W19DO-D 24 1277199
Facility ID: 185708
Station data: User record
Record ID: 4508
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	WZVC-LD	D23	LD	LIC	ATHENS, GA	BLANK0000178758	95.4 km
No	WZVC-LD	D23	LD	CP	ATHENS, GA	BLANK0000185000	101.1
Yes	WAAU-LD	D23	LD	LIC	AUGUSTA, GA	BLDTL20120522AFJ	27.5
No	WKTG-CD	D23	DC	LIC	NORCROSS, GA	BLANK0000081811	185.4
No	WPGA-TV	D23	DT	LIC	PERRY, GA	BLANK0000116580	138.2
No	WTOG-TV	D23	DT	CP	SAVANNAH, GA	BLANK0000149921	174.2
No	WBTB	D23	DT	LIC	CHARLOTTE, NC	BLANK0000147971	240.3
No	WAZS-LD	D23	LD	CP	NORTH CHARLESTON, SC	BLANK0000054749	210.7
No	WBXA-CD	D24	DC	CP	BIRMINGHAM, AL	BLANK0000035776	418.5
No	WHIQ	D24	DT	LIC	HUNTSVILLE, AL	BLANK0000004828	417.0
No	WTLF	D24	DT	CP	TALLAHASSEE, FL	BLANK0000035775	341.6
No	WTLF	D24	DT	LIC	TALLAHASSEE, FL	BLCDT20030303ABF	380.4
No	WPXC-TV	D24	DT	LIC	BRUNSWICK, GA	BLCDT20110426AAQ	291.2
No	WXTX	D24	DT	LIC	COLUMBUS, GA	BLANK0000064021	262.9
No	WVND-LD	D24	LD	LIC	SUWANEE, GA	BLANK0000179560	179.7
No	WGTA	D24	DT	LIC	TOCCOA, GA	BLANK0000001315	166.6
No	WCNC-TV	D24	DT	LIC	CHARLOTTE, NC	BLANK0000147158	239.2
No	W24CP-D	D24	LD	LIC	DURHAM, NC	BLANK0000004266	396.5
No	WUBX-CD	D24	DC	LIC	DURHAM, ETC., NC	BLANK0000108883	427.6
No	WWAY	D24	DT	LIC	WILMINGTON, NC	BLANK0000100423	387.9
No	WITV	D24	DT	LIC	CHARLESTON, SC	BLANK0000118279	247.3
No	NEW	D24	LD	CP	FLORENCE, SC	BNPDTL20090825AYZ	256.0
No	WDDA-LD	D24	LD	LIC	CHATTANOOGA, TN	BLANK0000185266	338.6
No	WETP-TV	D24	DT	LIC	SNEEDVILLE, TN	BLANK0000120200	340.5
No	WATL	D25	DT	LIC	ATLANTA, GA	BLCDT20020716AAH	194.5
No	W25FP-D	D25	LD	CP	YOUNG HARRIS, GA	BLANK0000162659	216.9
No	WJZY	D25	DT	LIC	BELMONT, NC	BLANK0000146872	241.4
No	WCIV	D25	DT	LIC	CHARLESTON, SC	BLANK0000184940	247.3
No	WZRB	D25	DT	LIC	COLUMBIA, SC	BLANK0000081456	139.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D24
Mask: Simple
Latitude: 33 24 18.30 N (NAD83)
Longitude: 82 17 41.30 W
Height AMSL: 169.5 m (Adjusted based on actual ground elevation calculation)
HAAT: 0.0 m
Peak ERP: 0.200 kW
Antenna: ELTI-ELTI UHF Panel (ID 1008435) 180.0 deg
Elev Pattern: Generic

49.8 dBu contour:
Azimuth ERP HAAT Distance
0.0 deg 0.000 kW 49.6 m 3.5 km

Table 2 W19DO-D Ch. 24 TVStudy Analysis of Proposal
(page 2 of 3)



45.0	0.001	60.3	4.7
90.0	0.000	33.4	2.2
135.0	0.043	34.9	8.8
180.0	0.200	51.7	15.6
225.0	0.040	50.5	10.5
270.0	0.000	32.8	2.2
315.0	0.002	29.8	3.6

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 43 m

Distance to Canadian border: 919.4 km

Distance to Mexican border: 1633.8 km

Conditions at FCC monitoring station: Powder Springs GA
Bearing: 283.4 degrees Distance: 230.5 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 296.7 degrees Distance: 2166.3 km

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 BLDLTL20120522AFJ LIC scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WAAU-LD	D23	LD	LIC	AUGUSTA, GA	BLDTL20120522AFJ	
Undesireds:	W19DO-D	D24	LD	APP	AUGUSTA, GA	W19DO-D 24 1277199	27.5 km
	WZVC-LD	D23	LD	LIC	ATHENS, GA	BLANK0000178758	114.8
	WPGA-TV	D23	DT	LIC	PERRY, GA	BLANK0000116580	165.0
	WTOC-TV	D23	DT	CP	SAVANNAH, GA	BLANK0000149921	169.7
	WBTW	D23	DT	LIC	CHARLOTTE, NC	BLANK0000147971	223.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
3425.0		464,349		3179.8		459,282	0.00 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
W19DO-D D24 LD APP		2.0		0		0.0	0
WPGA-TV D23 DT LIC		2.0		124		0.0	0
WTOC-TV D23 DT CP		117.0		2,097		78.3	1,319
WBTW D23 DT LIC		110.3		3,444		72.6	2,674

Interference to BLDLTL20120522AFJ LIC scenario 2

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	WAAU-LD	D23	LD	LIC	AUGUSTA, GA	BLDTL20120522AFJ	
Undesireds:	W19DO-D	D24	LD	APP	AUGUSTA, GA	W19DO-D 24 1277199	27.5 km
	WZVC-LD	D23	LD	CP	ATHENS, GA	BLANK0000185000	120.7
	WPGA-TV	D23	DT	LIC	PERRY, GA	BLANK0000116580	165.0
	WTOC-TV	D23	DT	CP	SAVANNAH, GA	BLANK0000149921	169.7
	WBTW	D23	DT	LIC	CHARLOTTE, NC	BLANK0000147971	223.0
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
3425.0		464,349		3177.9		459,282	0.00 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
W19DO-D D24 LD APP		2.0		0		0.0	0
WZVC-LD D23 LD CP		7.9		304		2.0	0
WPGA-TV D23 DT LIC		2.0		124		0.0	0
WTOC-TV D23 DT CP		117.0		2,097		76.3	1,113
WBTW D23 DT LIC		110.3		3,444		71.6	2,576

Table 2 W19DO-D Ch. 24 TVStudy Analysis of Proposal
(page 3 of 3)



Interference to proposal scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	W19DO-D	D24	LD	APP	AUGUSTA, GA	W19DO-D 24 1277199	
Undesireds:	WZVC-LD	D23	LD	LIC	ATHENS, GA	BLANK0000178758	95.4 km
	WGTA	D24	DT	LIC	TOCCOA, GA	BLANK0000001315	166.6
	WCNC-TV	D24	DT	LIC	CHARLOTTE, NC	BLANK0000147158	239.2
	WITV	D24	DT	LIC	CHARLESTON, SC	BLANK0000118279	247.3
Service area		Terrain-limited		IX-free		Percent IX	
186.8	4,662	176.9	4,578	168.9	4,578	4.50	0.00
Undesired				Total IX	Unique IX	Prcnt Unique IX	
WGTA D24 DT LIC				4.0 0	3.0 0	1.69	0.00
WCNC-TV D24 DT LIC				5.0 0	4.0 0	2.25	0.00
WITV D24 DT LIC				1.0 0	0.0 0	0.00	0.00

**Channel and
Facility
Information**

Section	Question	Response
Facility ID	185708	
State	Georgia	
City	AUGUSTA	
LPD Channel	24	

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	1277199
Coordinates (NAD83)	Latitude	33° 24' 18.3" N+
	Longitude	082° 17' 41.3" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	99.0 meters
	Support Structure Height	97.5 meters
	Ground Elevation (AMSL)	108.3 meters
Antenna Data	Height of Radiation Center Above Ground Level	6.1 meters
	Height of Radiation Center Above Mean Sea Level	114.4 meters
	Effective Radiated Power	0.2 kW

**Antenna
Technical Data**

Section	Question	Response
Antenna Type	Antenna Type	Directional Custom
	Do you have an Antenna ID?	Yes
	Antenna ID	1008435
Antenna Manufacturer and Model	Manufacturer:	ELTI
	Model	ELTI UHF Panel
	Rotation	180 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:	Simple

Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	Value	Degree	Value	Degree	Value	Degree	Value
0	1	90	0.028	180	0.05	270	0.029
10	0.955	100	0.053	190	0.033	280	0.082
20	0.851	110	0.075	200	0.025	290	0.158
30	0.7	120	0.087	210	0.056	300	0.263
40	0.531	130	0.09	220	0.073	310	0.389
50	0.367	140	0.084	230	0.074	320	0.537
60	0.232	150	0.062	240	0.072	330	0.7
70	0.132	160	0.038	250	0.06	340	0.851
80	0.052	170	0.044	260	0.033	350	0.955

Additional Azimuths

Degree	V _A
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