

ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Minor Modification of Digital Television Station Construction Permit

prepared for

Gray Television Licensee, LLC

WTOK-TV Meridian, MS

Facility ID 4686

Ch. 13 115 kW 160 m

Gray Television Licensee, LLC (“Gray”) is the licensee of digital television station W TOK-TV, Channel 11, Facility ID 4686, Meridian MS. Reassignment of W TOK-TV from Channel 11 to Channel 13 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice* (“CCRPN”, DA 17-317, released April 13, 2017). A Construction Permit (“CP” file# 0000033933) authorizes W TOK-TV to operate on Channel 13 at 160 kW effective radiated power (“ERP”) with a nondirectional antenna at 159 meters height above average terrain (“HAAT”). Gray proposes herein a minor modification of the reassignment CP to reduce the ERP to 115 kW and increase the antenna HAAT to 160 meters. No other changes are sought.

As with the current authorization, the proposed Channel 13 operation will employ a new antenna system to be top-mounted on the W TOK-TV tower in lieu of the existing Channel 11 antenna. The existing tower structure corresponds to FCC Antenna Structure Registration number 1041065, having an overall structure height above ground of 96.3 meters. The antenna replacement will result in a reduction in the structure’s overall height to 92.0 meters. Following construction, the FAA will be notified of the reduction in height and the FCC ASR will be modified accordingly.

The proposed antenna is an elliptically polarized nondirectional Dielectric model THV-10A13/VP-R O4 (42.9 percent vertical polarization). The horizontally polarized ERP is 115 kW and the vertically polarized ERP is 49.3 kW.

Figure 1 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 *CCRPN* baseline facility's population.

The presently authorized WТОK-TV noise limited service contour ("NLSC") extends beyond that of the *CCRPN* facility and resulted from a minor modification application filed during the second filing window.¹ The modifications sought herein provide an NLSC which also exceeds that of the *CCRPN* facility but is within that of the present authorization. A comparison map of the WТОK-TV authorized, proposed, and reassignment NLSC is provided as Figure 2.

Interference study per FCC OET Bulletin 69² shows that the proposal complies with the 0.5 percent limit of new interference caused to pertinent nearby post-auction full service and Class A television stations and reassignments 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 8 percent antenna relative field in downward elevations (pattern data shows less than 8 percent relative field at angles 30 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 5.4 $\mu\text{W}/\text{cm}^2$, which is 2.7 percent of the general population/uncontrolled maximum permitted exposure limit. This is below the five percent threshold limit described in §1.1307(b) regarding sites with multiple

¹Public Notice "Incentive Auction Task Force and Media Bureau Announce the Opening of the Second Filing Window for Eligible Full Power and Class A Television Station—October 3 Through November 2, 2017" DA 17-911, released September 20, 2017.

²FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004. This analysis employed the FCC's current "TVStudy" software with the default application processing template settings, 2 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.

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.

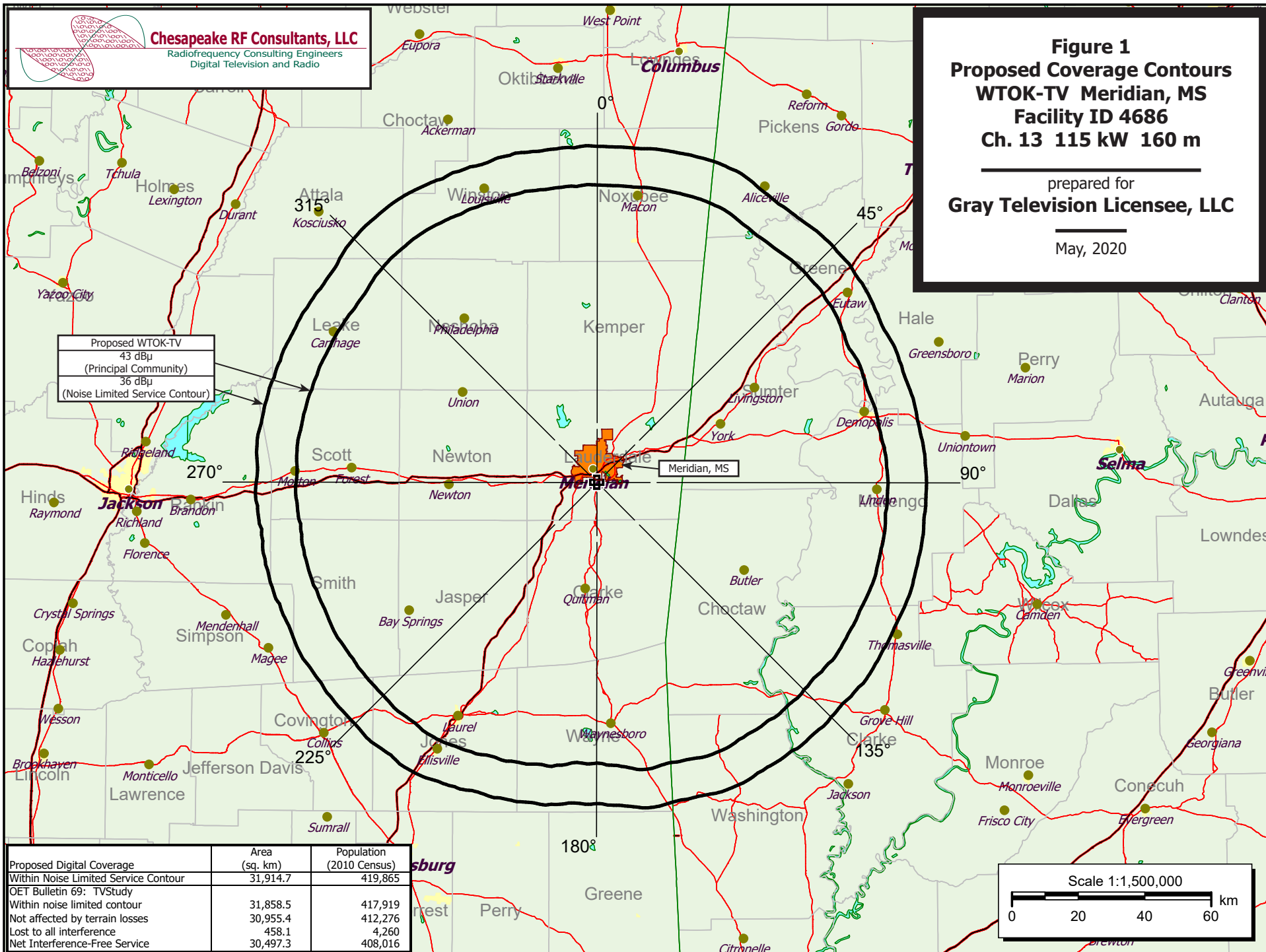
The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power 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.

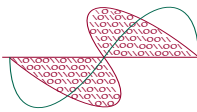
List of Attachments

Figure 1	Proposed Coverage Contours
Figure 2	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

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

Figure 2
Coverage Contour Comparison
WTOK-TV Meridian, MS
Facility ID 4686
Ch. 13 115 kW 160 m

prepared for
Gray Television Licensee, LLC

May, 2020

WTOK-TV Reassignment Baseline
90 kW 160 m
36 dBμ Contour (NLSC)

Proposed WTOK-TV
115 kW 160 m
36 dBμ Contour (NLSC)

Authorized WTOK-TV
Constr Permit File # 0000033933
160 kW 159 m
36 dBμ Contour (NLSC)

Scale 1:1,500,000
0 20 40 60 km

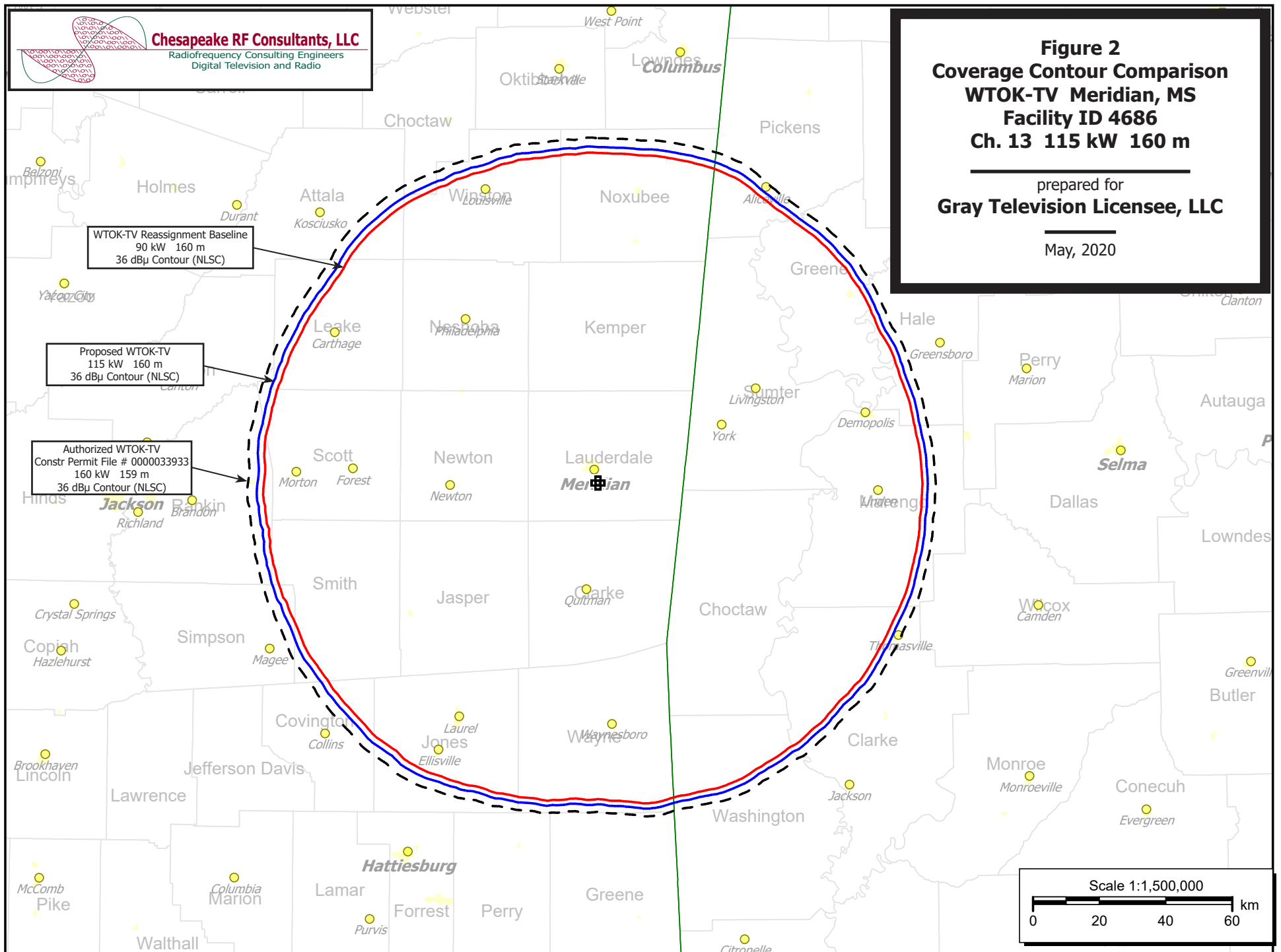


Table 1 WTOK-TV TVStudy Analysis of Proposal
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tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: WTOK-TV CP-MOD 115kW, Model: Longley-Rice
Start: 2020.05.15 09:17:22

Study created: 2020.05.15 09:17:22

Study build station data: LMS TV 2020-05-15

Proposal: WTOK-TV D13 DT APP MERIDIAN, MS
File number: WTOK-TV CP-MOD 115kW
Facility ID: 4686
Station data: User record
Record ID: 3100
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
Yes	WJTV	D12	DT	LIC	JACKSON, MS	BLCDT20111014ABR	161.3 km
No	KETG	D13	DT	LIC	ARKADELPHIA, AR	BLEDT20100308ACO	447.5
Yes	WMBB	D13	DT	LIC	PANAMA CITY, FL	BLCDT20090220AAF	382.5
Yes	WBRZ-TV	D13	DT	LIC	BATON ROUGE, LA	BLCDT20110420ABI	327.7
Yes	KLTM-TV	D13	DT	LIC	MONROE, LA	BLEDT20090619ABS	317.9
No	WRCB	D13	DT	APP	CHATTANOOGA, TN	BLANK0000035995	443.4
No	WRCB	D13	DT	LIC	CHATTANOOGA, TN	BLCDT20110729ACZ	443.4
Yes	WHBQ-TV	D13	DT	LIC	MEMPHIS, TN	BLCDT20100917AAC	334.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D13
Latitude: 32 19 39.00 N (NAD83)
Longitude: 88 41 28.00 W
Height AMSL: 286.5 m
HAAT: 160.3 m
Peak ERP: 115 kW
Antenna: Omnidirectional
Elev Pattn: Generic
Elec Tilt: 0.75

36.0 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	115 kW	164.0 m	101.1 km
45.0	115	157.4	100.3
90.0	115	145.7	99.0
135.0	115	150.5	99.5
180.0	115	125.6	96.4
225.0	115	178.6	102.9
270.0	115	175.5	102.5
315.0	115	185.0	103.6

Distance to Canadian border: 1167.4 km

Distance to Mexican border: 1065.7 km

Conditions at FCC monitoring station: Powder Springs GA
Bearing: 64.1 degrees Distance: 406.9 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 305.0 degrees Distance: 1712.8 km

Study cell size: 2.00 km
Profile point spacing: 1.00 km

Table 1 WTOK-TV TVStudy Analysis of Proposal
(page 2 of 4)



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

Interference to BLCDT20111014ABR LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WJTV	D12	DT	LIC	JACKSON, MS	BLCDT20111014ABR	
Undesireds:	WTOK-TV	D13	DT	BL	MERIDIAN, MS	DTVBL4686	161.3 km
	WTOK-TV	D13	DT	APP	MERIDIAN, MS	WTOK-TV CP-MOD 115kW	161.3
	KMLU	D11	DT	LIC	COLUMBIA, LA	BLCDT20121106AAT	156.8
	KTHV	D12	DT	LIC	LITTLE ROCK, AR	BLCDT20041029AIX	344.3
	KBMT	D12	DT	APP	BEAUMONT, TX	BLANK0000035665	401.8
	KLTM-TV	D13	DT	LIC	MONROE, LA	BLEDT20090619ABS	156.8
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
45792.3		987,206		44910.0		968,183	0.04 0.01
				44132.5		968,095	
Undesired		Total IX		Unique IX, before		Unique IX, after	
WTOK-TV D13 DT BL		177.4		5,281			
WTOK-TV D13 DT APP		193.6		5,369		193.6	5,369
KMLU D11 DT LIC		419.6		5,794		0.0	0
KTHV D12 DT LIC		79.8		289		79.8	289
KBMT D12 DT APP		7.9		10		7.9	10
KLTM-TV D13 DT LIC		512.3		6,954		92.8	1,160

Interference to BLCDT20111014ABR LIC scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WJTV	D12	DT	LIC	JACKSON, MS	BLCDT20111014ABR	
Undesireds:	WTOK-TV	D13	DT	BL	MERIDIAN, MS	DTVBL4686	161.3 km
	WTOK-TV	D13	DT	APP	MERIDIAN, MS	WTOK-TV CP-MOD 115kW	161.3
	KMLU	D11	DT	LIC	COLUMBIA, LA	BLCDT20121106AAT	156.8
	KTHV	D12	DT	LIC	LITTLE ROCK, AR	BLCDT20041029AIX	344.3
	KLTM-TV	D13	DT	LIC	MONROE, LA	BLEDT20090619ABS	156.8
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
45792.3		987,206		44910.0		968,193	0.04 0.01
				44140.4		968,105	
Undesired		Total IX		Unique IX, before		Unique IX, after	
WTOK-TV D13 DT BL		177.4		5,281			
WTOK-TV D13 DT APP		193.6		5,369		193.6	5,369
KMLU D11 DT LIC		419.6		5,794		0.0	0
KTHV D12 DT LIC		79.8		289		79.8	289
KLTM-TV D13 DT LIC		512.3		6,954		92.8	1,160

Interference to BLCDT20090220AAF LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WMBB	D13	DT	LIC	PANAMA CITY, FL	BLCDT20090220AAF	
Undesireds:	WTOK-TV	D13	DT	BL	MERIDIAN, MS	DTVBL4686	382.5 km
	WTOK-TV	D13	DT	APP	MERIDIAN, MS	WTOK-TV CP-MOD 115kW	382.5
	WFXL	D12	DT	CP	ALBANY, GA	BLANK0000035660	182.0
	WTLV	D13	DT	LIC	JACKSONVILLE, FL	BLCDT20090702AAJ	368.3
	WMAZ-TV	D13	DT	LIC	MACON, GA	BLCDT20090617AAN	318.3
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
35921.1		935,027		35654.1		906,659	0.01 0.00
				35478.8		906,659	
Undesired		Total IX		Unique IX, before		Unique IX, after	
WTOK-TV D13 DT BL		15.9		55			
WTOK-TV D13 DT APP		19.9		55		19.9	55
WTLV D13 DT LIC		28.0		4,552		8.0	2,714
WMAZ-TV D13 DT LIC		151.3		5,179		131.3	3,341

Table 1 WTOK-TV TVStudy Analysis of Proposal
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Interference to BLCDT20110420ABI LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WBRZ-TV	D13	DT	LIC	BATON ROUGE, LA	BLCDT20110420ABI	
Undesireds:	WTOK-TV	D13	DT	BL	MERIDIAN, MS	DTVBL4686	327.7 km
	WTOK-TV	D13	DT	APP	MERIDIAN, MS	WTOK-TV CP-MOD 115kW	327.7
	KLTM-TV	D13	DT	LIC	MONROE, LA	BLEDT20090619ABS	227.1
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
35795.3 2,223,336		35393.9 2,222,309		34379.5 2,215,762		34331.7 2,215,489	0.14 0.01
Undesired		Total IX		Unique IX, before		Unique IX, after	
WTOK-TV D13 DT BL		167.0		1,359		47.8 828	
WTOK-TV D13 DT APP		222.8		1,648		95.5 1,101	
KLTM-TV D13 DT LIC		966.7		5,719		839.5 5,172	

Interference to BLEDT20090619ABS LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	KLTM-TV	D13	DT	LIC	MONROE, LA	BLEDT20090619ABS	
Undesireds:	WTOK-TV	D13	DT	BL	MERIDIAN, MS	DTVBL4686	317.9 km
	WTOK-TV	D13	DT	APP	MERIDIAN, MS	WTOK-TV CP-MOD 115kW	317.9
	WJTV	D12	DT	LIC	JACKSON, MS	BLCDT20111014ABR	156.8
	KETG	D13	DT	LIC	ARCADELPHIA, AR	BLEDT20100308ACO	213.4
	WBRZ-TV	D13	DT	LIC	BATON ROUGE, LA	BLCDT20110420ABI	227.1
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
40813.7 694,280		40332.0 688,915		37848.1 666,573		37832.0 666,573	0.04 0.00
Undesired		Total IX		Unique IX, before		Unique IX, after	
WTOK-TV D13 DT BL		181.5		3,133		36.4 479	
WTOK-TV D13 DT APP		213.6		3,500		52.5 479	
WJTV D12 DT LIC		161.9		1,657		40.4 333	
KETG D13 DT LIC		1550.3		10,317		1550.3 10,317	
WBRZ-TV D13 DT LIC		824.5		10,916		691.5 8,377	

Interference to BLCDT20100917AAC LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WHBQ-TV	D13	DT	LIC	MEMPHIS, TN	BLCDT20100917AAC	
Undesireds:	WTOK-TV	D13	DT	BL	MERIDIAN, MS	DTVBL4686	334.0 km
	WTOK-TV	D13	DT	APP	MERIDIAN, MS	WTOK-TV CP-MOD 115kW	334.0
	KETG	D13	DT	LIC	ARCADELPHIA, AR	BLEDT20100308ACO	330.7
	KEMV	D13	DT	LIC	MOUNTAIN VIEW, AR	BLEDT20100608ACU	232.4
	WBKO	D13	DT	APP	BOWLING GREEN, KY	BLANK0000035946	371.2
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
33865.0 1,736,335		32826.8 1,708,345		31753.4 1,687,036		31693.5 1,686,149	0.19 0.05
Undesired		Total IX		Unique IX, before		Unique IX, after	
WTOK-TV D13 DT BL		259.0		4,813		251.0 4,780	
WTOK-TV D13 DT APP		318.8		5,700		310.8 5,667	
KETG D13 DT LIC		19.9		691		4.0 273	
KEMV D13 DT LIC		782.1		14,886		762.3 14,437	
WBKO D13 DT APP		36.2		1,370		36.2 1,370	

Interference to BLCDT20100917AAC LIC scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WHBQ-TV	D13	DT	LIC	MEMPHIS, TN	BLCDT20100917AAC	
Undesireds:	WTOK-TV	D13	DT	BL	MERIDIAN, MS	DTVBL4686	334.0 km
	WTOK-TV	D13	DT	APP	MERIDIAN, MS	WTOK-TV CP-MOD 115kW	334.0
	KETG	D13	DT	LIC	ARCADELPHIA, AR	BLEDT20100308ACO	330.7
	KEMV	D13	DT	LIC	MOUNTAIN VIEW, AR	BLEDT20100608ACU	232.4
	WBKO	D13	DT	LIC	BOWLING GREEN, KY	BLCDT20090423ABM	371.2

Table 1 WTOK-TV TVStudy Analysis of Proposal
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Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
33865.0	1,736,335	32826.8	1,708,345	31781.5	1,688,149	31721.7	1,687,262	0.19	0.05
Undesired		Total IX		Unique IX, before		Unique IX, after			
WTOK-TV D13 DT BL		259.0	4,813	251.0	4,780				
WTOK-TV D13 DT APP		318.8	5,700			310.8	5,667		
KETG D13 DT LIC		19.9	691	4.0	273	4.0	273		
KEMV D13 DT LIC		782.1	14,886	762.3	14,437	762.3	14,437		
WBKO D13 DT LIC		8.1	257	8.1	257	8.1	257		

Interference to proposal scenario 1
1.03% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WTOK-TV	D13	DT	APP	MERIDIAN, MS	WTOK-TV CP-MOD 115kW	
Undesireds:	WJTV	D12	DT	LIC	JACKSON, MS	BLCDT20111014ABR	161.3 km
	WMBB	D13	DT	LIC	PANAMA CITY, FL	BLCDT20090220AAF	382.5
	WBRZ-TV	D13	DT	LIC	BATON ROUGE, LA	BLCDT20110420ABI	327.7
	KLTM-TV	D13	DT	LIC	MONROE, LA	BLEDT20090619ABS	317.9
	WHBQ-TV	D13	DT	LIC	MEMPHIS, TN	BLCDT20100917AAC	334.0

Service area		Terrain-limited		IX-free		Percent IX	
31858.5	417,919	30955.4	412,276	30497.3	408,016	1.48	1.03
Undesired		Total IX		Unique IX		Prct Unique IX	
WJTV D12 DT LIC		120.9	1,685	40.3	303	0.13	0.07
WMBB D13 DT LIC		24.2	13	24.2	13	0.08	0.00
WBRZ-TV D13 DT LIC		68.3	1,245	8.0	93	0.03	0.02
KLTM-TV D13 DT LIC		289.5	3,147	116.7	929	0.38	0.23
WHBQ-TV D13 DT LIC		156.1	1,200	96.0	704	0.31	0.17

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	4686
	State	Mississippi
	City	MERIDIAN
	DTV Channel	13
	Designated Market Area	Meridian
Facility Type	Facility Type	Commercial
	Station Type	Main
Zone	Zone	3

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1041065
Coordinates (NAD83)	Latitude	32° 19' 39.0" N+
	Longitude	088° 41' 28.0" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	96.3 meters
	Support Structure Height	96.3 meters
	Ground Elevation (AMSL)	203.6 meters
Antenna Data	Height of Radiation Center Above Ground Level	82.9 meters
	Height of Radiation Center Above Average Terrain	160.3 meters
	Height of Radiation Center Above Mean Sea Level	286.5 meters
	Effective Radiated Power	115 kW

Antenna Technical Data

Section	Question	Response
Antenna Type	Antenna Type	Non-Directional
	Do you have an Antenna ID?	
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	DIE
	Model	THV-10A13/VP-R O4
	Rotation	
	Electrical Beam Tilt	0.75
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
DTV and DTS: Elevation Pattern	Polarization	Elliptical
	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	

**Construction
Permit
Certifications**

Section	Question	Response
Post-Incentive Auction Expedited Processing	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
Environmental Effect	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
Broadcast Facility	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