

## **ENGINEERING EXHIBIT**

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

prepared for

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

K40MB-D Monroe, LA

Facility ID 184070

Ch. 40 (digital) 10.9 kW

*Gray Television Licensee, LLC* (“Gray”) is the licensee of digital Low Power Television station K40MB-D, Channel 40, Monroe LA, Facility ID 184070. K40MB-D is licensed to operate with 4.7 kW effective radiated power (“ERP”), directional (file #0000014004). K40MB-D is presently silent (file #0000014077). *Gray* herein seeks a Construction Permit to authorize relocation of K40MB-D, change to a nondirectional antenna, and increase ERP and antenna height.

As proposed herein, K40MB-D will be relocated to the tower structure associated with FCC Antenna Structure Registration number 1239438, 0.06 km from the licensed K40MB-D site (immediately adjacent). The proposed K40MB-D facility will employ a new antenna system to be side-mounted on the tower and no change to the overall structure height is proposed.

The proposed K40MB-D facility will operate with a nondirectional antenna at 10.9 kW ERP using a “full service” out of channel emission mask. Figure 1 depicts the coverage contour of the proposed facility as well as that of the licensed facility. The service area overlap demonstrates compliance with §73.3572 for a minor change.

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,

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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 1 km terrain increment. Comparisons of various results of this computer program (run on a Mac processor) to the FCC’s

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.

The nearest FCC monitoring station is 704 km distant at Powder Springs, GA. This exceeds by a large margin the threshold minimum distance specified in §73.1030(c)(3) that would suggest consideration of the monitoring station. The site is not located within the areas requiring coordination with "quiet" zones specified in §73.1030(a) and (b). There are no authorized AM stations within 3 kilometers of the site. The site location is beyond the border areas requiring international coordination.

### **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 the worst-case of 100 percent antenna relative field in downward elevations, 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  $15.8 \mu\text{W}/\text{cm}^2$ , which is 3.8 percent of the general population / uncontrolled maximum permissible exposure limit. 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. When the antenna's elevation pattern is considered, the calculated RF exposure level will be even lower

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

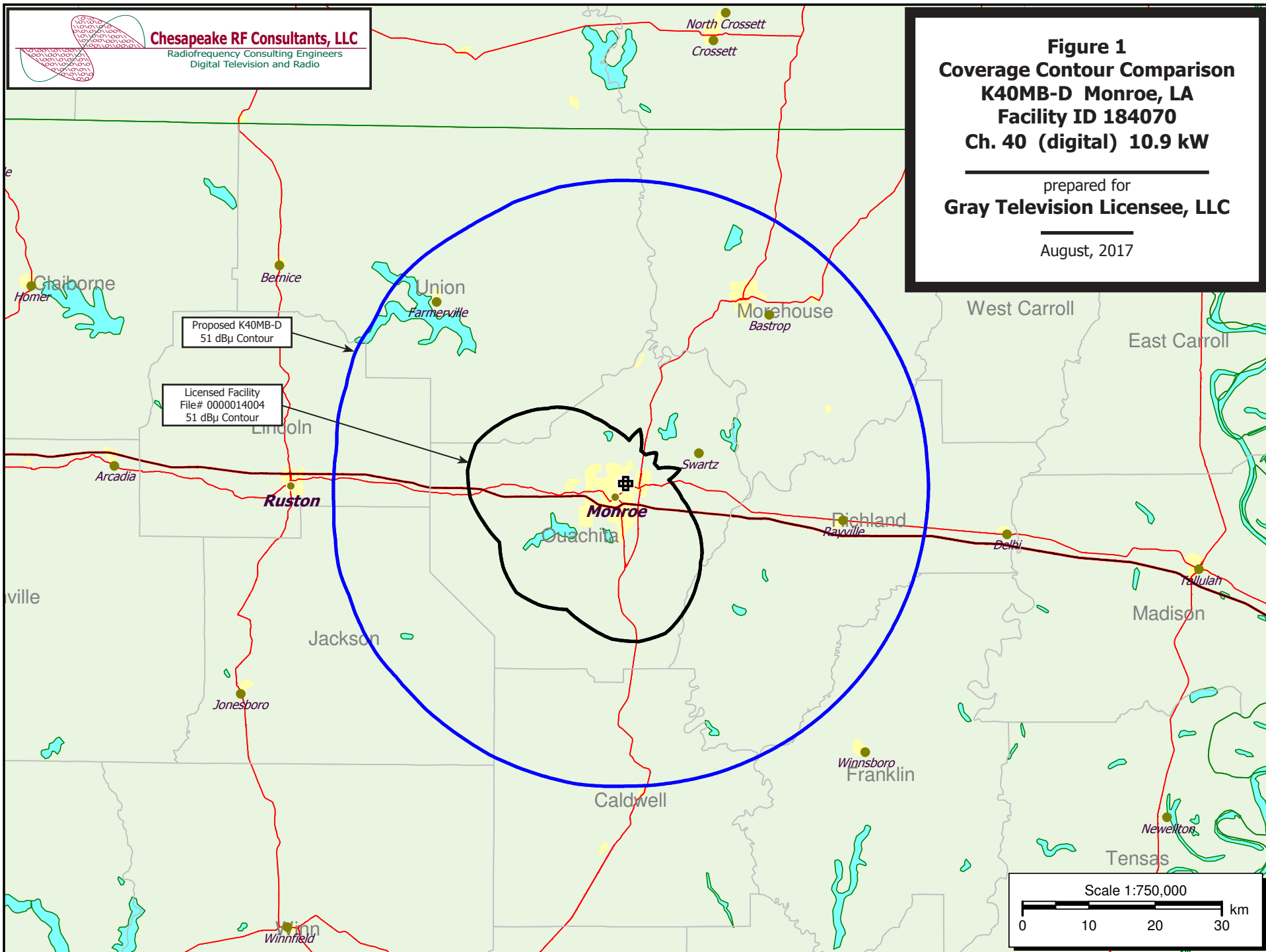
exhibit is limited to the evaluation of exposure to RF electromagnetic field. No increase in structure height is proposed.

List of Attachments

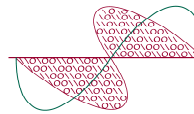
Figure 1	Coverage Contour Comparison
Table 1	Interference Analysis Results Summary
Form 2100	Engineering Data for FCC Form 2100

**Chesapeake RF Consultants, LLC**

Joseph M. Davis, P.E.	August 13, 2017	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600



**Table 1 K40MB-D OET Bulletin 69 Interference Study**  
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**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

tvstudy v2.2.3 (DAezul)  
Database: localhost, Study: K40MB-D 10.9kW NOND FS (1743), Model: Longley-Rice  
Start: 2017.08.13 20:27:21

Study created: 2017.08.13 20:26:04

Study build station data: LMS TV 2017-08-11 LMSTV

Proposal: K40MB-D D40 LD APP MONROE, LA  
File number: K40MB-D 10.9kW NOND FS  
Facility ID: 184070  
Station data: User record  
Record ID: 902  
Country: U.S.

Build options:  
Protect records not on baseline channel  
Protect baseline records from LPTV

Stations affected by proposal:

Call	Chan	Svc	Status	City, State	File Number	Distance
WDBD	D40	DT	LIC	JACKSON, MS	BLCDT20090612ADU	165.2 km
K41MJ-D	D41	LD	CP	MONROE, LA	BNPDTL20100510AEF	8.7

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D40  
Mask: Full Service  
Latitude: 32 31 40.00 N (NAD83)  
Longitude: 92 6 8.70 W  
Height AMSL: 176.5 m  
HAAT: 0.0 m  
Peak ERP: 10.9 kW  
Antenna: Omnidirectional  
Elev Pattn: Generic  
Elec Tilt: 1.50

51.2 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	10.9 kW	155.4 m	45.2 km
45.0	10.9	151.8	45.0
90.0	10.9	154.9	45.2
135.0	10.9	157.5	45.4
180.0	10.9	154.9	45.2
225.0	10.9	150.4	44.9
270.0	10.9	135.9	43.9
315.0	10.9	158.0	45.4

Database HAAT does not agree with computed HAAT  
Database HAAT: 0 m Computed HAAT: 152 m

Distance to Canadian border: 1308.5 km

Distance to Mexican border: 865.2 km

Conditions at FCC monitoring station: Powder Springs GA  
Bearing: 75.8 degrees Distance: 702.0 km

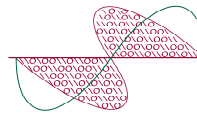
Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:  
Bearing: 309.4 degrees Distance: 1444.1 km

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

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

**Table 1 K40MB-D OET Bulletin 69 Interference Study**  
(page 2 of 2)



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Maximum new IX to LPTV: 2.00%

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Interference to BLCDT20090612ADU LIC, scenario 1

Desired:	Call WDBD	Chan D40	Svc DT	Status LIC	City, State JACKSON, MS	File Number BLCDT20090612ADU	Distance			
Undesireds:	K40MB-D KAJN-CD	D40 D40	LD DC	APP LIC	MONROE, LA LAFAYETTE, LA	K40MB-D 10.9kW NOND FS BLDTA20100813BHM	165.2 km 285.5			
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX			
40344.7	919,048	40169.0		917,660	40165.9	917,660	39711.8	913,097	1.13	0.50
Undesired				Total IX	Unique IX, before		Unique IX, after			
K40MB-D	D40	LD	APP	455.2	4,563		454.1	4,563		
KAJN-CD	D40	DC	LIC	3.0	0		3.0	0		

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Interference to BNPDTL20100510AEF CP, scenario 1

Desired:	Call K41MJ-D	Chan D41	Svc LD	Status CP	City, State MONROE, LA	File Number BNPDTL20100510AEF	Distance		
Undesireds:	K40MB-D	D40	LD	APP	MONROE, LA	K40MB-D 10.9kW NOND FS	8.7 km		
	K41MI-D	D41	LD	CP	EL DORADO, AR	BNPDTL20100510ADE	90.3		
	KENH-LD	D41	LD	LIC	HOT SPRINGS, AR	BLDTL20141201BAX	235.3		
	KLMW-LD	D41	LD	LIC	LUFKIN, TX	BLANK0000013219	172.1		
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX		
2009.8	151,647	2009.8	151,647	2007.8	151,647	2002.8	151,647	0.25	0.00
Undesired				Total IX	Unique IX, before	Unique IX, after			
K40MB-D	D40	LD	APP	7.0	0	5.0	0		
K41MI-D	D41	LD	CP	2.0	0	0.0	0		

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Interference to proposal, scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	K40MB-D	D40	LD	APP	MONROE, LA	K40MB-D 10.9kW NOND FS	
Service area		Terrain-limited		IX-free		Percent IX	
6375.7		219,076		6374.7		219,076	0.00 0.00
				6374.7		219,076	

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	184070
	State	Louisiana
	City	MONROE
	LPD Channel	40

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1239438
Coordinates (NAD83)	Latitude	32° 31' 40.0" N+
	Longitude	092° 06' 08.7" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	236.2 meters
	Support Structure Height	235.3 meters
	Ground Elevation (AMSL)	22.6 meters
Antenna Data	Height of Radiation Center Above Ground Level	153.9 meters
	Height of Radiation Center Above Mean Sea Level	176.5 meters
	Effective Radiated Power	10.9 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	DLP-12B
	Rotation	
	Electrical Beam Tilt	1.5
	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:	Full Service