

ENGINEERING EXHIBIT

Application for Minor Modification of Digital Low Power Television Station Construction Permit

prepared for

Gray Television Licensee, LLC

WZCD-LD Cincinnati-Dayton, OH

Facility ID 187440

Ch. 30 15 kW Nondirectional

Gray Television Licensee, LLC (“Gray”) is the licensee of digital Low Power Television station WZCD-LD, Channel 30, Cincinnati-Dayton OH, Facility ID 187440. WZCD-LD is licensed to operate (file# 0000153260) with 7 kW effective radiated power (“ERP”), directional. A Construction Permit (“CP” file# 0000155339) authorizes WZCD-LD to relocate to a different site and operate at 15 kW ERP nondirectional. *Gray* herein seeks a modification of the CP to specify an alternate location.

The proposed facility will employ a new side-mounted antenna on the existing tower structure associated with FCC Antenna Structure Registration number 1014825, located 44.6 km (27.7 miles) from the WZCD-LD licensed site and 1.8 km (1.1 miles) from the current CP site. No change to the overall structure height is proposed.

The proposed antenna is a Dielectric model DLP-12B having horizontal polarization. The proposed ERP is 15 kW 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 and CP facilities, demonstrating compliance with §73.3572 for a minor change.

Interference study per OET Bulletin 69¹ shows that the proposal complies with the FCC’s interference protection requirements toward all digital television, television translator, LPTV, and

¹FCC 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

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.

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 $3.6 \mu\text{W}/\text{cm}^2$, which is 1.0 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.

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	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. February 2, 2023
207 Old Dominion Road Yorktown, VA 23692 703-650-9600

Table 1 WZCD-LD TVStudy Analysis of Proposal
 (page 1 of 4)



tvstudy v2.2.5 (4uoc83)
 Database: localhost, Study: WZCD-LD 1014825 prop, Model: Longley-Rice
 Start: 2023.02.02 14:54:46

Study created: 2023.02.02 14:54:45

Study build station data: LMS TV 2023-02-01

Proposal: WZCD-LD D30 LD APP CINCINNATI-DAYTON, OH
 File number: WZCD-LD 1014825
 Facility ID: 187440
 Station data: User record
 Record ID: 4819
 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	DDW22DE	N22+	TX	APP	DAYTON, OH	BLTTL20100511AAU	27.1 km
No	WFYI-LD	D29	LD	LIC	INDIANAPOLIS, IN	BLANK0000200980	167.6
No	WJYL-CD	D29	DC	LIC	JEFFERSONVILLE, IN	BLANK0000162183	179.9
No	WAMS-LD	D29z	LD	LIC	MINSTER/NEW BREMEN, OH	BLANK0000106606	101.0
Yes	WPTO	D29	DT	LIC	OXFORD, OH	BLANK0000113643	43.3
No	WGTE-TV	D29	DT	LIC	TOLEDO, OH	BLEDT20031110AKO	253.2
No	WOOH-LD	D29	LD	LIC	ZANESVILLE, OH	BLANK0000193625	113.0
No	WCHS-TV	D29	DT	LIC	CHARLESTON, WV	BLANK0000167887	240.4
No	WEIU-TV	D30	DT	LIC	CHARLESTON, IL	BLANK0000093935	342.1
No	WDCI-LD	D30	LD	LIC	CHICAGO, IL	BLDTL20120131AAW	385.9
No	WTCT	D30	DT	LIC	MARION, IL	BLANK0000096223	461.6
No	WSJV	D30	DT	LIC	ELKHART, IN	BLANK0000124380	286.5
No	WELW-LD	D30	LD	LIC	EVANSVILLE, IN	BLANK0000163325	326.4
No	W30EH-D	D30	LD	LIC	FORT WAYNE, IN	BLANK0000198714	193.0
No	WSDI-LD	D30	LD	LIC	INDIANAPOLIS, IN	BLANK0000107877	167.9
Yes	WKPC-TV	D30	DT	LIC	LOUISVILLE, KY	BLANK0000087420	180.2
Yes	WKMR	D30	DT	LIC	MOREHEAD, KY	BLANK0000075044	165.1
No	WNEM-TV	D30	DT	LIC	BAY CITY, MI	BLANK0000185174	445.2
No	WVIZ	D30	LD	LIC	Cleveland, OH	BLANK0000151111	316.9
Yes	WHIZ-TV	D30	DT	LIC	ZANESVILLE, OH	BLANK0000125049	205.6
No	WBPA-LD	N30+	TX	LIC	PITTSBURGH, PA	BLANK0000007299	378.6
No	WPTG-CD	D30	DC	LIC	Pittsburgh, PA	BLANK0000129480	386.1
No	W30EI-D	D30z	LD	LIC	SHARON, PA	BLANK0000107600	382.8
No	W30EG-D	D30	LD	LIC	KNOXVILLE, TN	BLANK0000138506	388.7
No	WNAB	D30	DT	LIC	NASHVILLE, TN	BLANK0000159669	418.4
No	WDBJ	D30	DT	LIC	ROANOKE, VA	BLANK0000199694	442.9
No	W30CO-D	D30	LD	LIC	WHEELING, WV	BLDTT20100112AAM	311.4
No	WQDE-LD	D31	LD	LIC	Indianapolis, IN	BLANK0000108667	167.9
No	WDTN	D31	DT	LIC	DAYTON, OH	BLANK0000204146	27.0
No	WJOS-LD	D31	LD	CP	POMEROY, OH	BLANK0000054745	203.6
No	WTZP-LD	D31	LD	LIC	PORTSMOUTH, OH	BLANK0000074508	134.7
No	WTZP-LD	D31	LD	CP	PORTSMOUTH, OH	BLANK0000181565	134.7
No	DDWWRD-LP	N32+	TX	APP	DAYTON, OH	BLTTL20071011AAP	30.0

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D30
 Mask: Full Service
 Latitude: 39 28 51.10 N (NAD83)
 Longitude: 84 19 5.10 W
 Height AMSL: 327.4 m
 HAAT: 0.0 m
 Peak ERP: 15.0 kW
 Antenna: Omnidirectional
 Elev Pattn: Generic

Table 1 WZCD-LD TVStudy Analysis of Proposal
 (page 2 of 4)



Elec Tilt: 1.00

50.3 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	15.0 kW	99.2 m	43.4 km
45.0	15.0	67.7	39.0
90.0	15.0	41.1	33.2
135.0	15.0	81.3	41.0
180.0	15.0	98.0	43.3
225.0	15.0	101.1	43.6
270.0	15.0	125.8	45.8
315.0	15.0	88.2	42.0

Database HAAT does not agree with computed HAAT
 Database HAAT: 0 m Computed HAAT: 88 m

Proposal 25.32 dBu contour does not cross Canadian border
 Distance to Canadian border: 280.5 km

Distance to Mexican border: 1886.9 km

Conditions at FCC monitoring station: Allegan MI
 Bearing: 339.0 degrees Distance: 373.4 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
 Bearing: 279.1 degrees Distance: 1782.4 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 BLANK0000113643 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WPTO	D29	DT	LIC	OXFORD, OH	BLANK0000113643	
Undesireds:	WZCD-LD	D30	LD	APP	CINCINNATI-DAYTON, OH	WZCD-LD 1014825	43.3 km
	WIPX-TV	D28	DT	LIC	BLOOMINGTON, IN	BLANK0000106045	143.4
	WLEX-TV	D28	DT	CP	LEXINGTON, KY	BLANK0000157703	121.7
	WSYX	D28	DT	LIC	COLUMBUS, OH	BLANK0000129744	157.2
	WJYL-CD	D29	DC	LIC	JEFFERSONVILLE, IN	BLANK0000162183	141.1
	WSBT-TV	D29	DT	LIC	SOUTH BEND, IN	BLANK0000087455	312.0
	WKGB-TV	D29	DT	LIC	BOWLING GREEN, KY	BLANK0000087457	292.0
	WNEO	D29	DT	LIC	ALLIANCE, OH	BLANK0000120667	365.6
	WGTE-TV	D29	DT	LIC	TOLEDO, OH	BLEDT20031110AKO	296.3
	WCHS-TV	D29	DT	LIC	CHARLESTON, WV	BLANK0000167887	240.5

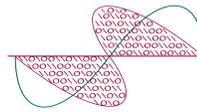
Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
21977.5 2,961,080	21713.4 2,949,597	20529.1 2,915,167	20514.2 2,910,114	0.07 0.17

Undesired	Total IX	Unique IX, before	Unique IX, after
WZCD-LD D30 LD APP	14.9 5,053	14.9 5,053	
WIPX-TV D28 DT LIC	10.9 15	4.0 10	
WLEX-TV D28 DT CP	57.2 651	29.1 269	
WSYX D28 DT LIC	1.0 0	0.0 0	
WJYL-CD D29 DC LIC	756.7 11,116	712.7 10,040	
WSBT-TV D29 DT LIC	24.0 5,127	17.0 311	
WKGB-TV D29 DT LIC	1.0 0	0.0 0	
WNEO D29 DT LIC	4.0 495	0.0 0	
WGTE-TV D29 DT LIC	2.0 495	0.0 0	
WCHS-TV D29 DT LIC	405.6 23,573	356.5 17,799	

 Interference to BLANK0000113643 LIC scenario 2

Call	Chan	Svc	Status	City, State	File Number	Distance
------	------	-----	--------	-------------	-------------	----------

Table 1 WZCD-LD TVStudy Analysis of Proposal
(page 3 of 4)



Desired:	WPTO	D29	DT	LIC	OXFORD, OH	BLANK0000113643	
Undesireds:	WZCD-LD	D30	LD	APP	CINCINNATI-DAYTON, OH	WZCD-LD 1014825	43.3 km
	WIPX-TV	D28	DT	LIC	BLOOMINGTON, IN	BLANK0000106045	143.4
	WLEX-TV	D28	DT	LIC	LEXINGTON, KY	BLANK0000087372	121.7
	WSYX	D28	DT	LIC	COLUMBUS, OH	BLANK0000129744	157.2
	WJYL-CD	D29	DC	LIC	JEFFERSONVILLE, IN	BLANK0000162183	141.1
	WSBT-TV	D29	DT	LIC	SOUTH BEND, IN	BLANK0000087455	312.0
	WKGB-TV	D29	DT	LIC	BOWLING GREEN, KY	BLANK0000087457	292.0
	WNEO	D29	DT	LIC	ALLIANCE, OH	BLANK0000120667	365.6
	WGTE-TV	D29	DT	LIC	TOLEDO, OH	BLEDT20031110AKO	296.3
	WCHS-TV	D29	DT	LIC	CHARLESTON, WV	BLANK0000167887	240.5

	Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX
	21977.5	2,961,080	21713.4	2,949,597	20556.2	2,915,436	20541.3	2,910,383	0.07 0.17

Undesired				Total IX	Unique IX, before	Unique IX, after
WZCD-LD D30 LD APP		14.9		5,053		14.9 5,053
WIPX-TV D28 DT LIC		10.9		15	4.0 10	4.0 10
WLEX-TV D28 DT LIC		12.0		73	2.0 0	2.0 0
WSYX D28 DT LIC		1.0		0	0.0 0	0.0 0
WJYL-CD D29 DC LIC		756.7		11,116	719.8 10,262	719.8 10,262
WSBT-TV D29 DT LIC		24.0		5,127	17.0 311	17.0 311
WKGB-TV D29 DT LIC		1.0		0	0.0 0	0.0 0
WNEO D29 DT LIC		4.0		495	0.0 0	0.0 0
WGTE-TV D29 DT LIC		2.0		495	0.0 0	0.0 0
WCHS-TV D29 DT LIC		405.6		23,573	360.5 17,835	360.5 17,835

Interference to BLANK0000087420 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WKPC-TV	D30	DT	LIC	LOUISVILLE, KY	BLANK0000087420	
Undesireds:	WZCD-LD	D30	LD	APP	CINCINNATI-DAYTON, OH	WZCD-LD 1014825	180.2 km
	WJYL-CD	D29	DC	LIC	JEFFERSONVILLE, IN	BLANK0000162183	0.3
	WEIU-TV	D30	DT	LIC	CHARLESTON, IL	BLANK0000093935	252.3
	WTCT	D30	DT	LIC	MARION, IL	BLANK0000096223	293.8
	WKMR	D30	DT	LIC	MOREHEAD, KY	BLANK0000075044	212.8
	WNAB	D30	DT	LIC	NASHVILLE, TN	BLANK0000159669	248.8

	Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX
	17059.3	1,525,561	16717.7	1,516,424	16534.5	1,512,074	16527.5	1,511,996	0.04 0.01

Undesired				Total IX	Unique IX, before	Unique IX, after
WZCD-LD D30 LD APP		24.2		215		7.0 78
WJYL-CD D29 DC LIC		26.2		235	18.1 144	18.1 144
WEIU-TV D30 DT LIC		32.1		736	11.0 618	10.0 616
WTCT D30 DT LIC		72.5		673	34.2 309	31.2 302
WKMR D30 DT LIC		79.4		1,279	44.2 891	42.2 891
WNAB D30 DT LIC		51.5		2,144	24.3 1,841	24.3 1,841

Interference to BLANK0000075044 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WKMR	D30	DT	LIC	MOREHEAD, KY	BLANK0000075044	
Undesireds:	WZCD-LD	D30	LD	APP	CINCINNATI-DAYTON, OH	WZCD-LD 1014825	165.1 km
	WCHS-TV	D29	DT	LIC	CHARLESTON, WV	BLANK0000167887	133.5
	WKPC-TV	D30	DT	LIC	LOUISVILLE, KY	BLANK0000087420	212.8
	WHIZ-TV	D30	DT	LIC	ZANESVILLE, OH	BLANK0000125049	230.0
	WYFF	D30	DT	LIC	GREENVILLE, SC	BLANK0000190317	348.1
	WDBJ	D30	DT	LIC	ROANOKE, VA	BLANK0000199694	305.9

	Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX
	18253.8	462,820	17518.3	415,477	17334.2	405,761	17324.2	405,045	0.06 0.18

Undesired				Total IX	Unique IX, before	Unique IX, after
WZCD-LD D30 LD APP		23.1		1,288		10.0 716
WCHS-TV D29 DT LIC		43.2		1,615	36.2 1,509	36.2 1,509
WKPC-TV D30 DT LIC		48.4		1,761	31.3 1,634	26.3 1,609
WHIZ-TV D30 DT LIC		72.2		4,112	49.1 3,495	47.0 3,413

Table 1 WZCD-LD TVStudy Analysis of Proposal
(page 4 of 4)



WYFF D30 DT LIC	2.0	0	0.0	0	0.0	0
WDBJ D30 DT LIC	50.5	2,952	37.4	2,354	36.4	1,994

Interference to BLANK0000125049 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance			
	WHIZ-TV	D30	DT	LIC	ZANESVILLE, OH	BLANK0000125049				
Undesireds:	WZCD-LD	D30	LD	APP	CINCINNATI-DAYTON, OH	WZCD-LD 1014825	205.6 km			
	WNEO	D29	DT	LIC	ALLIANCE, OH	BLANK0000120667	141.7			
	WCHS-TV	D29	DT	LIC	CHARLESTON, WV	BLANK0000167887	169.2			
	WKMR	D30	DT	LIC	MOREHEAD, KY	BLANK0000075044	230.0			
	WPTG-CD	D30	DC	LIC	Pittsburgh, PA	BLANK0000129480	181.0			
	WDBJ	D30	DT	LIC	ROANOKE, VA	BLANK0000199694	342.8			
	Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX					
	17238.1	924,996	16636.5	856,635	16502.7	826,706	16497.7	824,745	0.03	0.24

Undesired	Total IX	Unique IX, before	Unique IX, after			
WZCD-LD D30 LD APP	41.2	15,072	5.0	1,961		
WNEO D29 DT LIC	1.0	0	0.0	0		
WCHS-TV D29 DT LIC	1.0	0	0.0	0		
WKMR D30 DT LIC	97.9	28,965	54.0	18,620	41.9	14,954
WPTG-CD D30 DC LIC	56.0	10,643	20.0	614	17.0	528
WDBJ D30 DT LIC	26.8	690	12.9	349	12.9	349

Interference to proposal scenario 1
31.37% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance	
	WZCD-LD	D30	LD	APP	CINCINNATI-DAYTON, OH	WZCD-LD 1014825		
Undesireds:	WPTO	D29	DT	LIC	OXFORD, OH	BLANK0000113643	43.3 km	
	WKPC-TV	D30	DT	LIC	LOUISVILLE, KY	BLANK0000087420	180.2	
	WKMR	D30	DT	LIC	MOREHEAD, KY	BLANK0000075044	165.1	
	WHIZ-TV	D30	DT	LIC	ZANESVILLE, OH	BLANK0000125049	205.6	
	WDTN	D31	DT	LIC	DAYTON, OH	BLANK00000204146	27.0	
	WTZP-LD	D31	LD	LIC	PORTSMOUTH, OH	BLANK0000074508	134.7	
	Service area	Terrain-limited	IX-free	Percent IX				
	5482.8	1,756,863	5367.3	1,705,238	4083.3	1,170,231	23.92	31.37

Undesired	Total IX	Unique IX	Prcnt Unique IX			
WPTO D29 DT LIC	200.5	148,166	158.8	118,284	2.96	6.94
WKPC-TV D30 DT LIC	15.1	5,589	3.0	596	0.06	0.03
WKMR D30 DT LIC	8.0	4,520	0.0	0	0.00	0.00
WHIZ-TV D30 DT LIC	13.9	2,483	1.0	0	0.02	0.00
WDTN D31 DT LIC	1112.2	413,173	1064.4	379,238	19.83	22.24

**Channel and
Facility
Information**

Section	Question	Response
Facility ID	187440	
State	Ohio	
City	Cincinnati-Dayton	
LPD Channel	30	

**Antenna Location
Data**

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1014825
Coordinates (NAD83)	Latitude	39° 28' 51.1" N+
	Longitude	084° 19' 05.1" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	95.1 meters
	Support Structure Height	86.3 meters
	Ground Elevation (AMSL)	251.2 meters
Antenna Data	Height of Radiation Center Above Ground Level	76.2 meters
	Height of Radiation Center Above Mean Sea Level	327.4 meters
	Effective Radiated Power	15 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:	Dielectric
	Model	DLP-12B
	Rotation	
	Electrical Beam Tilt	1
	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