

ENGINEERING EXHIBIT

Application for Minor Modification of Construction Permit Digital to Digital Replacement Translator Television Station

prepared for

Gray Television Licensee, LLC

WHSV-TV Harrisonburg, VA

DTDRT Broadway, VA

Facility ID 4688

Ch. 15 (digital) 15 kW

Gray Television Licensee, LLC (“Gray”) is the licensee of television station WHSV-TV, Harrisonburg, VA, Facility ID 4688. WHSV-TV was reassigned from Channel 49 to Channel 20 in the *Incentive Auction Closing and Channel Reassignment Public Notice* (“CCRPN”, DA 17-317, released April 13, 2017). An “unable to construct” waiver was granted regarding implementation of WHSV-TV’s Channel 20 reassignment at the WHSV-TV Channel 49 reference transmitter site at Big Mountain, and a priority filing window¹ Construction Permit (“CP”, file# 0000029912) authorized the WHSV-TV Channel 20 post-auction facility to be sited at Elliott Knob, located 76.6 km from the Channel 49 site at Big Mountain. WHSV-TV has completed its transition to Channel 20 and is now licensed with its reassignment facility (file# 0000063970).

Owing to the 76.6 km change in WHSV-TV’s transmitter site location, there will be widespread areas of service loss. To recover those losses, *Gray* has obtained authorizations to construct three new digital-to-digital replacement translator (“DTDRT”) facilities. One of those DTDRT authorizations is a CP to utilize Channel 15 (file# 0000054797, granted February 19, 2019) to aid in serving Broadway and other nearby communities. *Gray* herein seeks to modify the Channel 15 DTDRT CP to specify an alternate directional antenna and associated pattern. No change in site location, antenna height, or maximum effective radiated power (“ERP”) is sought.

¹Public Notice “*Incentive Auction Task Force and Media Bureau Announce the Opening of the First Priority Filing Window for Eligible Full Power and Class A Television Stations from August 9 through September 8, 2017*” DA 17-724, released July 31, 2017.

As proposed herein, the Channel 15 DTDRT will operate at the currently authorized antenna location and height. The overall structure elevation is less than 61 meters above ground and passes the FCC's TOWAIR program for the transmitter location, thus FCC antenna structure registration is not necessary. No change to the overall structure height will result.

The Channel 15 DTDRT site is located within the quiet zone area specified in §73.1030(a) requiring coordination with National Radio Astronomy Observatory ("NRAO") at Green Bank, WV. The existing DTDRT Channel 15 CP was coordinated with NRAO. The alternate directional antenna specified herein provides suppression towards NRAO and complies with the power limit identified by NRAO in the direction of the Green Bank Telescope. A detailed description of the technical details of this proposal is being supplied to NRAO for review. Upon receipt of NRAO's formal concurrence, an amendment to this application will be submitted to include the letter of concurrence.

The proposed Channel 15 DTDRT facility will operate with a directional antenna at 15 kW ERP using a "full service" 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 authorized and proposed facilities, demonstrating compliance with §73.3572 for a minor change. As demonstrated in Figure 3, the proposed DTDRT coverage contour does not extend beyond WHSV-TV's pre-auction digital service area. Figure 3 also shows that the Channel 15 DTDRT will provide service to various locations that lost interference-free service when WHSV-TV transitioned to its reassignment facility.

Interference study per OET Bulletin 69² shows that the proposal complies with the FCC's interference protection requirements toward all digital television, television translator, LPTV, and Class A stations (existing and post-auction). The results, summarized in Table 1, show that

²FCC 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.

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 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 10 percent antenna relative field in downward elevations, the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $6.0 \mu\text{W}/\text{cm}^2$, which is 1.9 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 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	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Figure 3	Repack Service Loss – Proposed Translator Contour
Table 1	TVStudy Analysis of Proposal
Form 2100	Engineering Data for FCC Form 2100

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	March 29, 2019	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

Azimuth Pattern

Type:	ETU-2PC-H	Polarization:	Horizontal
Directivity:	4.22 numeric (6.25 dB)	Frequency:	15 (ATSC)
Peak(s) at:		Location:	Harrisonburg, VA
		NOTE: Pattern shape and directivity may vary with channel and mounting configuration.	

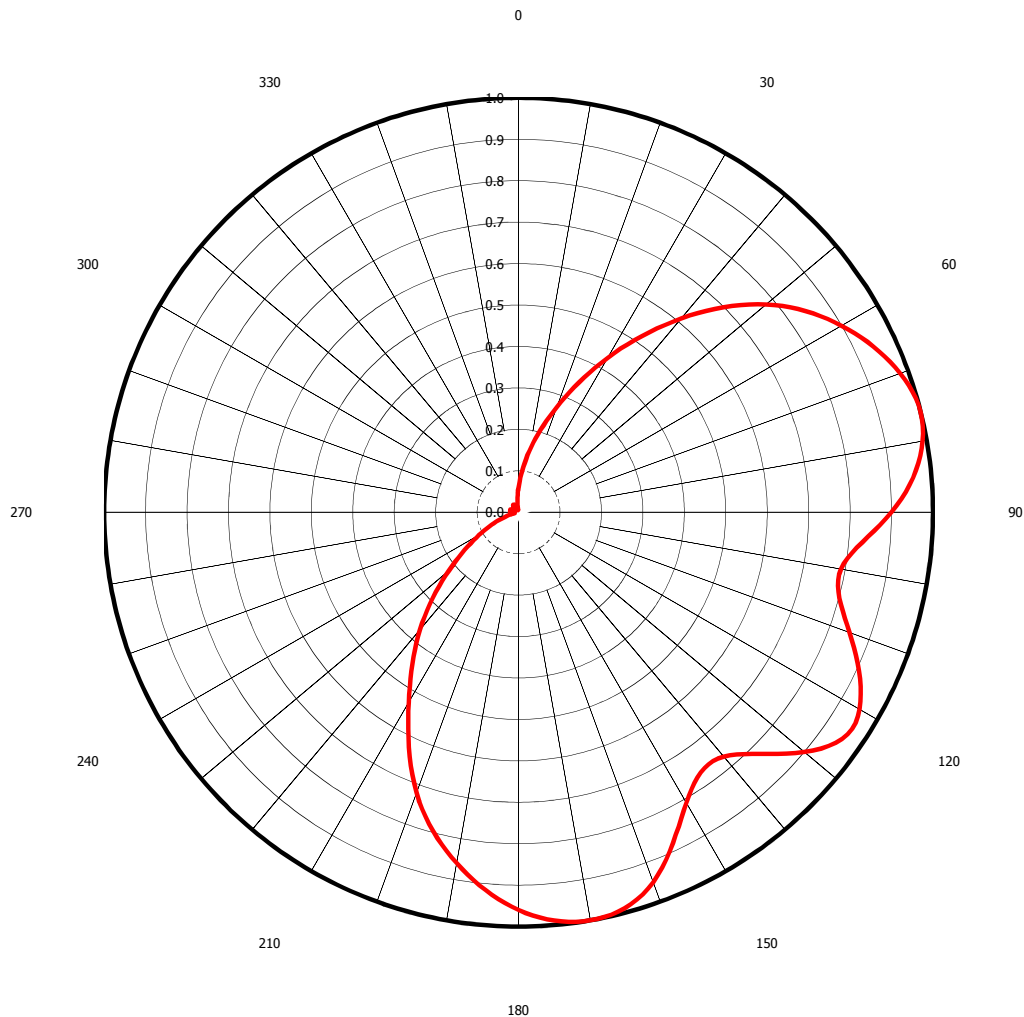
Relative Field**ELECTRONICS RESEARCH, INC. ERI®**

Figure 1
Antenna Azimuthal Pattern
WHSV-TV Harrisonburg, VA
DTDRT Broadway, VA
Facility ID 4688
Ch. 15 (digital) 15 kW

prepared for
Gray Television Licensee, LLC

March, 2019



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

Figure 2
Coverage Contour Comparison
WHSV-TV Harrisonburg, VA
DTDRT Broadway, VA
Facility ID 4688
Ch. 15 (digital) 15 kW

prepared for
Gray Television Licensee, LLC

March, 2019

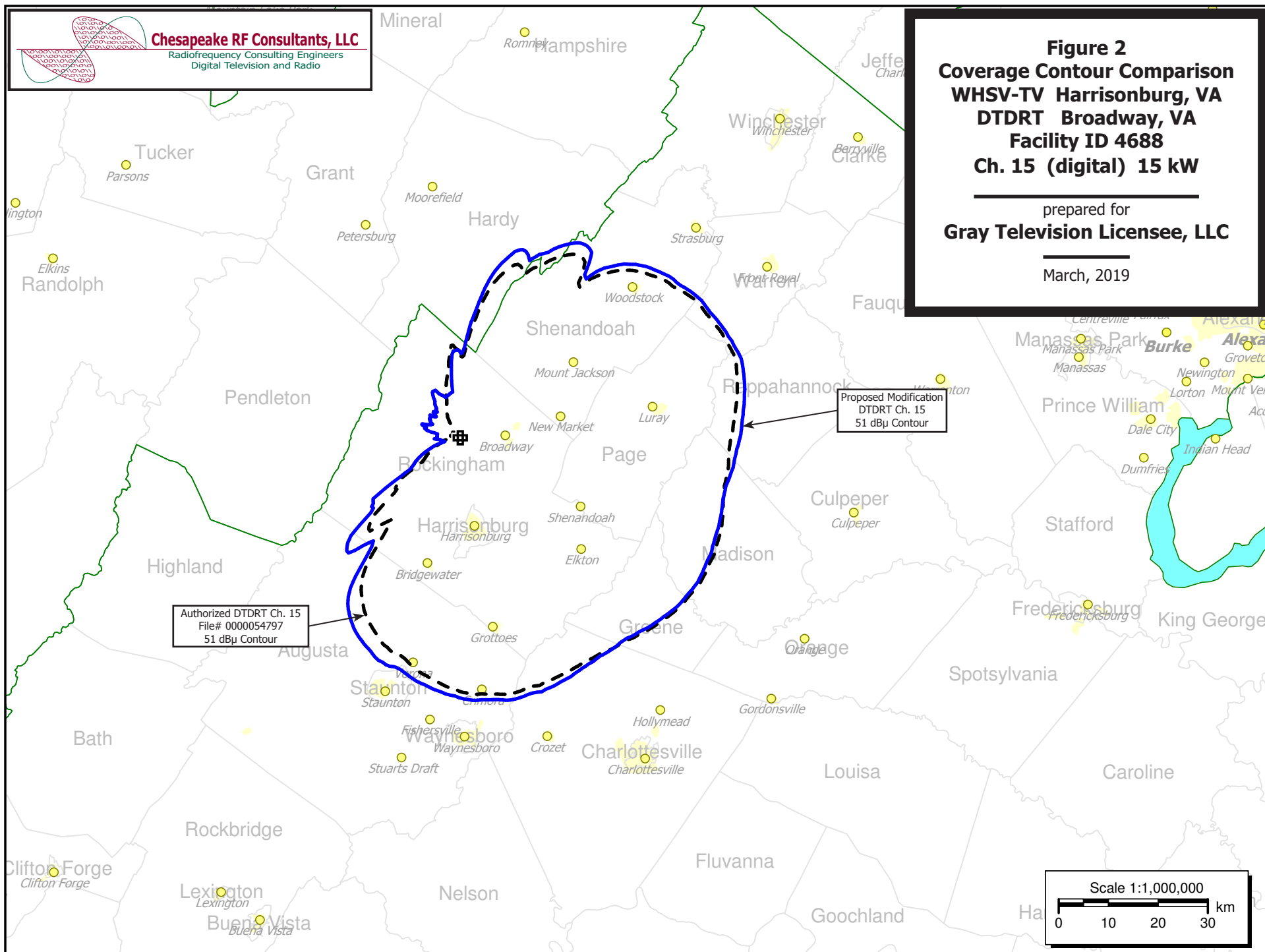


Figure 3
Repack Service Loss
Proposed Translator Contour
WHSV-TV Harrisonburg, VA
DTDRT Broadway, VA
Facility ID 4688
Ch. 15 (digital) 15 kW

prepared for
Gray Television Licensee, LLC

March, 2019

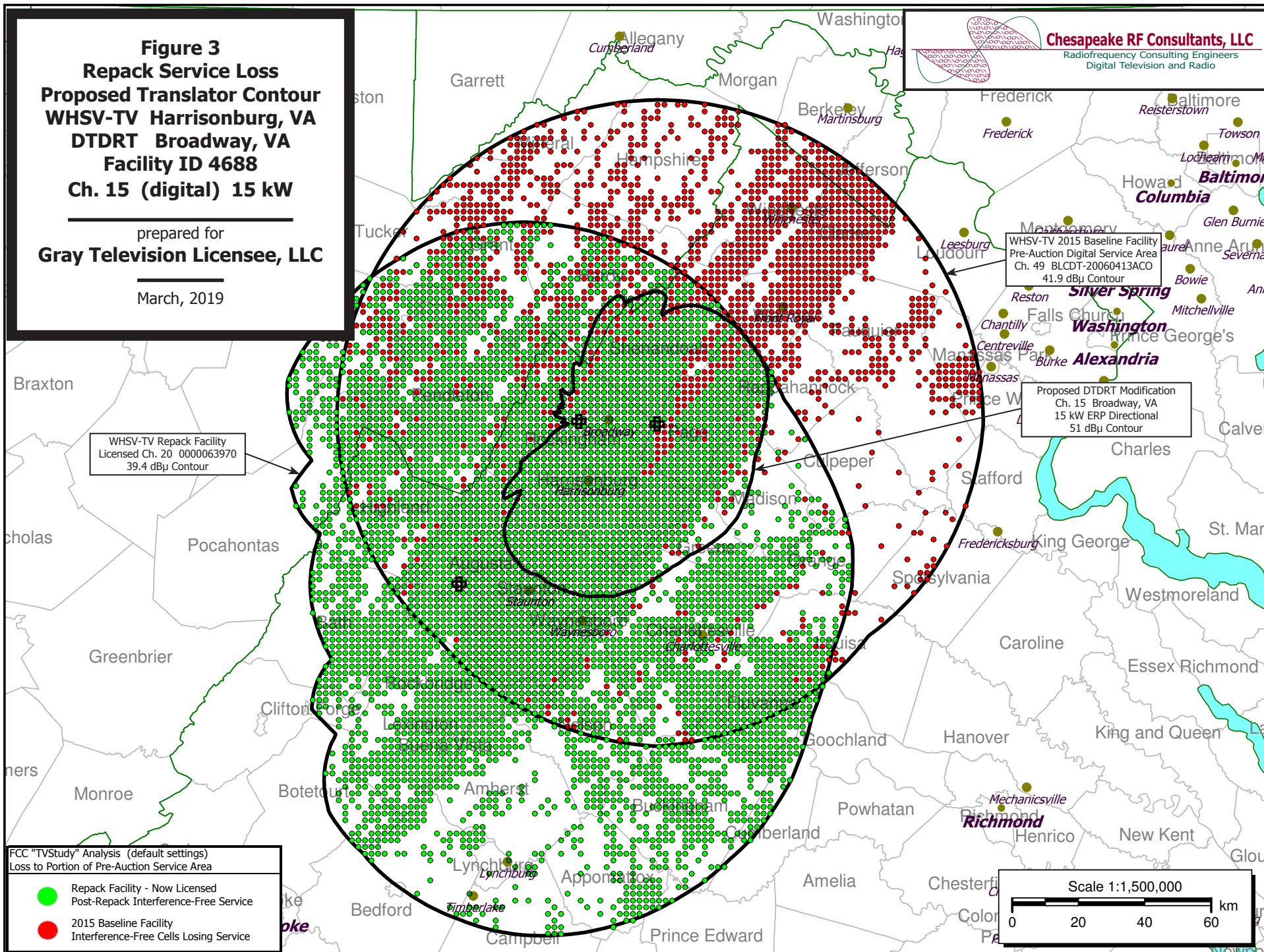
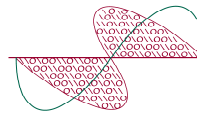


Table 1 WHSV-TV DTDRT TVStudy Analysis of Proposal

Ch. 15 Broadway VA (page 1 of 5)

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

tvstudy v2.2.5 (4uoc83)

Database: localhost, Study: WHSV-TV DRT-15 Mod-ERI, Model: Longley-Rice

Start: 2019.03.27 17:05:17

Study created: 2019.03.27 17:05:17

Study build station data: LMS TV 2019-03-25

Proposal: WHSV-TV D15 LD APP Broadway, VA
 File number: WHSV-TV DRT-15 Mod-ERI
 Facility ID: 4688
 Station data: User record
 Record ID: 2615
 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	WWTB-LD	D14	LD	LIC	WASHINGTON, DC	BLDTL20140320ADR	162.1 km
No	WGFX-TV	D14	DT	LIC	BURLINGTON, NC	BLCDT20060418ADO	270.6
No	DWAZH-CD	D14	DC	APP	HARRISONBURG, VA	BLANK0000001154	70.7
No	DWAZH-CD	D14	DC	APP	HARRISONBURG, VA	BLANK0000001573	70.7
Yes	DWAZH-CD	D14	LD	APP	HARRISONBURG, VA	BMPDTL20141029ABQ	63.1
Yes	DWAZH-CD	D14	LD	APP	HARRISONBURG, VA	BDCCDTL20131227ADS	63.1
No	WXOB-LD	D14	LD	CP	RICHMOND, VA	BDCCDTL20100726AIN	164.0
No	WKMR	D15	DT	LIC	MOREHEAD, KY	BMLED20120503ADU	395.1
No	W21CK-D	D15	DC	CP	CHARLOTTE, NC	BLANK0000034509	417.6
No	W15DO-D	D15	LD	CP	GREENVILLE, NC	BDCCDTL20120416ABG	347.6
Yes	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000034036	327.7
No	WRPX-TV	D15	DT	LIC	ROCKY MOUNT, NC	BLANK0000048990	285.4
No	W15EF-D	D15	LD	LIC	SPARTA, NC	BLANK0000055108	303.6
No	WHWD-LD	D15	LD	CP	Winston-Salem, NC	BLANK0000029372	320.4
No	WEWS-TV	D15	DT	LIC	CLEVELAND, OH	BLCDT20091211ACS	389.8
No	W23BZ-D	D15	LD	CP	COLUMBUS, OH	BLANK0000054838	383.9
No	WQCW	D15	DT	CP	PORTSMOUTH, OH	BLANK0000025192	288.5
No	WPSU-TV	D15	DD	LIC	CLEARFIELD, PA	BLCDT20130614ACC	282.2
No	WNSC-TV	D15	DT	LIC	ROCK HILL, SC	BLCDT20060111AAK	459.3
Yes	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000041206	162.1
No	WUDW-LD	D15	LD	LIC	CROZET, VA	BLANK0000014020	136.5
No	WUDW-LD	D15	LD	CP	CROZET, VA	BLANK0000066865	166.7
No	W43BO	D15	LD	CP	MARION, ETC., VA	BDISDTL20090910AAZ	299.6
No	WINP-TV	D16	DT	CP	PITTSBURGH, PA	BLANK0000034405	223.6
Yes	WVAW-LD	D16	LD	LIC	CHARLOTTESVILLE, VA	BLDTL20090218AEG	78.5
No	WAZC-LP	N16-	TX	LIC	LURAY, VA	BLTTL20020508AAB	25.3
No	WUSV-LD	D16	LD	LIC	CLARKSBURG, WV	BLDTL20140616AEQ	141.4
No	W41DK-D	D16	LD	CP	KEYSER, WV	BLANK0000035614	87.4
No	W22CY	N22-	TX	LIC	CLARKSBURG, WV	BLTTL20060120ADM	141.4

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D15
 Mask: Full Service
 Latitude: 38 36 29.30 N (NAD83)
 Longitude: 78 54 8.70 W
 Height AMSL: 690.3 m
 HAAT: 0.0 m
 Peak ERP: 15.0 kW
 Antenna: ERI Ch-15 AZ 20180425-834-1 0.0 deg
 Elev Pattn: Generic
 Elec Tilt: 1.00

48.8 dBu contour:

Azimuth ERP HAAT Distance

Table 1 WHSV-TV DTDRT TVStudy Analysis of Proposal
Ch. 15 Broadway VA (page 2 of 5)



0.0 deg	0.054 kW	137.2 m	19.6 km
45.0	7.25	262.2	52.1
90.0	12.2	328.9	58.5
135.0	10.5	298.8	56.1
180.0	13.8	247.3	54.6
225.0	1.31	118.5	34.7
270.0	0.006	12.8	5.4
315.0	0.003	96.5	8.3

Database HAAT does not agree with computed HAAT
 Database HAAT: 0 m Computed HAAT: 188 m

Distance to Canadian border: 432.3 km

Distance to Mexican border: 2192.4 km

Conditions at FCC monitoring station: Laurel MD
 Bearing: 70.4 degrees Distance: 190.4 km

**Proposal is within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
 Bearing: 282.7 degrees Distance: 2259.7 km

No land mobile station failures found

Proposal is not within the Offshore Radio Service protected area

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 BMPDTL20141029ABQ APP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	DWAZH-CD	D14	LD	APP	HARRISONBURG, VA	BMPDTL20141029ABQ	
Undesireds:	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	63.1 km
	WWTD-LD	D14	LD	LIC	WASHINGTON, DC	BLDTL20140320ADR	108.0
	W14DF-D	D14	LD	CP	ELLIOTTSBURG, PA	BLANK0000064130	168.4
	WXOB-LD	D14	LD	CP	RICHMOND, VA	BDCCDTL20100726AIN	165.6
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000041206	108.0
	WUDW-LD	D15	LD	LIC	CROZET, VA	BLANK0000014020	147.8
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	11665.0	541,935	7886.9	384,195	7561.0	347,967	7553.0 347,822 0.11 0.04
Undesired				Total IX	Unique IX, before		Unique IX, after
WHSV-TV D15 LD APP				9.0	145		8.0 145
WWTD-LD D14 LD LIC				304.0	35,969		181.4 16,104
W14DF-D D14 LD CP				45.9	4,046		20.9 259
WXOB-LD D14 LD CP				108.6	17,841		1.0 0
WFDC-DT D15 DT LIC							

 Interference to BDCCDTL20131227ADS APP scenario 1

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	DWAZH-CD	D14	LD	APP	HARRISONBURG, VA	BDCCDTL20131227ADS	
Undesireds:	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	63.1 km
	WWTD-LD	D14	LD	LIC	WASHINGTON, DC	BLDTL20140320ADR	108.0
	W14DF-D	D14	LD	CP	ELLIOTTSBURG, PA	BLANK0000064130	168.4
	WXOB-LD	D14	LD	CP	RICHMOND, VA	BDCCDTL20100726AIN	165.6
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000041206	108.0
	WUDW-LD	D15	LD	LIC	CROZET, VA	BLANK0000014020	147.8
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
	11665.0	541,935	7886.9	384,195	7561.0	347,967	7553.0 347,822 0.11 0.04

Table 1 WHSV-TV DTDRT TVStudy Analysis of Proposal
Ch. 15 Broadway VA (page 3 of 5)



Undesired		Total IX	Unique IX, before	Unique IX, after
WHSV-TV D15 LD APP	9.0	145		8.0 145
WWTD-LD D14 LD LIC	304.0	35,969	182.4 16,104	181.4 16,104
WXOB-LD D14 LD CP	45.9	4,046	20.9 259	20.9 259
WFDC-DT D15 DT LIC	108.6	17,841	1.0 0	1.0 0

Interference to BLANK0000034036 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000034036	
Undesireds:	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	327.7 km
	WRDC	D14	DT	CP	DURHAM, NC	BLANK0000034511	0.7
	W21CK-D	D15	DC	CP	CHARLOTTE, NC	BLANK0000034509	219.2
	WLTX	D15	DT	CP	COLUMBIA, SC	BLANK0000028035	268.9
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000041206	384.8
	WPXU-TV	D16	DT	CP	JACKSONVILLE, NC	BLANK0000026976	161.6
	WXII-TV	D16	DT	CP	WINSTON-SALEM, NC	BLANK0000034697	183.3

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
50009.5 3,911,481	49689.0 3,904,735	48753.4 3,791,937	48753.4 3,791,937	0.00 0.00

Undesired		Total IX	Unique IX, before	Unique IX, after
WHSV-TV D15 LD APP	2.0	2		0.0 0
WRDC D14 DT CP	166.4	9,022	166.4 9,022	166.4 9,022
W21CK-D D15 DC CP	49.9	3,372	11.9 763	11.9 763
WLTX D15 DT CP	123.8	3,141	88.8 955	88.8 955
WFDC-DT D15 DT LIC	63.2	1,376	63.2 1,376	61.2 1,374
WPXU-TV D16 DT CP	107.3	1,649	107.3 1,649	107.3 1,649
WXII-TV D16 DT CP	476.0	98,664	452.0 95,792	452.0 95,792

Interference to BLANK0000041206 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000041206	
Undesireds:	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	162.1 km
	WETA-TV	D14	DT	BL	WASHINGTON, DC	DTVBL65670	1.2
	WPSU-TV	D15	DD	LIC	CLEARFIELD, PA	BLDT20130614ACC	268.8
	WCPB	D16	DT	CP	SALISBURY, MD	BLANK0000029877	143.2

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
24893.2 8,155,201	24129.8 8,114,748	23724.2 8,079,299	23613.2 8,063,496	0.47 0.20

Undesired		Total IX	Unique IX, before	Unique IX, after
WHSV-TV D15 LD APP	352.9	36,713		111.0 15,803
WETA-TV D14 DT BL	3.0	55	3.0 55	3.0 55
WPSU-TV D15 DD LIC	401.7	35,387	401.7 35,387	159.8 14,477
WCPB D16 DT CP	1.0	7	1.0 7	1.0 7

Interference to BLDTL20090218AEG LIC scenario 1

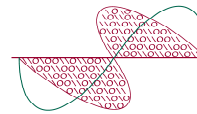
Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WVAW-LD	D16	LD	LIC	CHARLOTTESVILLE, VA	BLDTL20090218AEG	
Undesireds:	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	78.5 km
	WUDW-LD	D15	LD	LIC	CROZET, VA	BLANK0000014020	62.6
	WCPB	D16	DT	CP	SALISBURY, MD	BLANK0000029877	256.3
	WXII-TV	D16	DT	CP	WINSTON-SALEM, NC	BLANK0000034697	245.1
	WINP-TV	D16	DT	CP	PITTSBURGH, PA	BLANK0000034405	302.0
	WTKR	D16	DT	CP	NORFOLK, VA	BLANK0000034472	218.1
	W41DK-D	D16	LD	CP	KEYSER, WV	BLANK0000035614	163.8
	WXOB-LP	N17z	TX	LIC	RICHMOND, VA	BLTTA20020809AAN	94.2

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
11032.2 425,440	9115.5 299,042	8976.3 295,805	8976.3 295,805	0.00 0.00

Undesired		Total IX	Unique IX, before	Unique IX, after
WHSV-TV D15 LD APP	1.0	0		0.0 0

Table 1 WHSV-TV DTDRT TVStudy Analysis of Proposal

Ch. 15 Broadway VA (page 4 of 5)



Chesapeake RF Consultants, LLC

Radiofrequency Consulting Engineers
Digital Television and Radio

WUDW-LD D15 LD LIC	2.0	15	2.0	15	2.0	15
WCPB D16 DT CP	14.1	250	3.0	59	3.0	59
WXII-TV D16 DT CP	94.9	2,829	56.5	1,065	56.5	1,065
WINP-TV D16 DT CP	1.0	0	0.0	0	0.0	0
WTKR D16 DT CP	70.6	2,090	28.3	190	28.3	190
W41DK-D D16 LD CP	7.0	0	3.0	0	3.0	0

Interference to BLDTL20090218AEG LIC scenario 2

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WVAW-LD	D16	LD	LIC	CHARLOTTESVILLE, VA	BLDTL20090218AEG	
Undesireds:	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	78.5 km
	WCPB	D16	DT	CP	SALISBURY, MD	BLANK0000029877	256.3
	WXII-TV	D16	DT	CP	WINSTON-SALEM, NC	BLANK0000034697	245.1
	WINP-TV	D16	DT	CP	PITTSBURGH, PA	BLANK0000034405	302.0
	WTKR	D16	DT	CP	NORFOLK, VA	BLANK0000034472	218.1
	W41DK-D	D16	LD	CP	KEYSER, WV	BLANK0000035614	163.8
	WXOB-LP	N17z	TX	LIC	RICHMOND, VA	BLTTA20020809AAN	94.2
	Service area	Terrain-limited		IX-free, before		IX-free, after	Percent New IX
11032.2	425,440	9115.5	299,042	8978.3	295,820	8978.3 295,820	0.00 0.00

Undesired	Total IX	Unique IX, before	Unique IX, after
WHSV-TV D15 LD APP	1.0 0	0.0 0	
WCPB D16 DT CP	14.1 250	3.0 59	3.0 59
WXII-TV D16 DT CP	94.9 2,829	56.5 1,065	56.5 1,065
WINP-TV D16 DT CP	1.0 0	0.0 0	0.0 0
WTKR D16 DT CP	70.6 2,090	28.3 190	28.3 190
W41DK-D D16 LD CP	7.0 0	3.0 0	3.0 0

Interference to proposal scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	
Undesireds:	DWAZH-CD	D14	LD	APP	HARRISONBURG, VA	BMPDTL20141029ABQ	63.1 km
	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000034036	327.7
	WPSU-TV	D15	DD	LIC	CLEARFIELD, PA	BLEDT20130614ACC	282.2
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000041206	162.1
	WUDW-LD	D15	LD	LIC	CROZET, VA	BLANK0000014020	136.5
	WVAW-LD	D16	LD	LIC	CHARLOTTESVILLE, VA	BLDTL20090218AEG	78.5
	Service area	Terrain-limited		IX-free		Percent IX	
5543.8	219,521	4037.7	177,104	3948.5	175,976	2.21 0.64	

Undesired	Total IX	Unique IX	Prcnt Unique IX
DWAZH-CD D14 LD APP	5.0 277	5.0 277	0.12 0.16
WRAZ D15 DT CP	1.0 0	0.0 0	0.00 0.00
WPSU-TV D15 DD LIC	2.0 0	2.0 0	0.05 0.00
WFDC-DT D15 DT LIC	76.1 851	68.1 851	1.69 0.48
WUDW-LD D15 LD LIC	13.0 0	2.0 0	0.05 0.00
WVAW-LD D16 LD LIC	4.0 0	0.0 0	0.00 0.00

Interference to proposal scenario 2

**MX: 2.91% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	
Undesireds:	DWAZH-CD	D14	LD	APP	HARRISONBURG, VA	BDCCDTL20131227ADS	63.1 km
	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000034036	327.7
	WPSU-TV	D15	DD	LIC	CLEARFIELD, PA	BLEDT20130614ACC	282.2
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000041206	162.1
	WUDW-LD	D15	LD	LIC	CROZET, VA	BLANK0000014020	136.5
	WVAW-LD	D16	LD	LIC	CHARLOTTESVILLE, VA	BLDTL20090218AEG	78.5
	Service area	Terrain-limited		IX-free		Percent IX	
5543.8	219,521	4037.7	177,104	3871.7	171,958	4.11 2.91	

Table 1 WHSV-TV DTDRT TVStudy Analysis of Proposal

Ch. 15 Broadway VA (page 5 of 5)



Undesired		Total IX		Unique IX	Prcnt Unique IX
DWAZH-CD D14 LD APP	99.8	4,454	81.8	4,295	2.03 2.43
WRAZ D15 DT CP	1.0	0	0.0	0	0.00 0.00
WPSU-TV D15 DD LIC	2.0	0	2.0	0	0.05 0.00
WFDC-DT D15 DT LIC	76.1	851	50.1	692	1.24 0.39
WUDW-LD D15 LD LIC	13.0	0	2.0	0	0.05 0.00
WVAW-LD D16 LD LIC	4.0	0	0.0	0	0.00 0.00

Interference to proposal scenario 3

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	
Undesireds:	DWAZH-CD	D14	LD	APP	HARRISONBURG, VA	BMPDTL20141029ABQ	63.1 km
	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000034036	327.7
	WPSU-TV	D15	DD	LIC	CLEARFIELD, PA	BLANK0000041206	282.2
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000066865	162.1
	WUDW-LD	D15	LD	CP	CROZET, VA	BLANK0000066865	166.7
	WVAW-LD	D16	LD	LIC	CHARLOTTESVILLE, VA	BLDTL20090218AEG	78.5

Service area	Terrain-limited	IX-free	Percent IX
5543.8 219,521	4037.7 177,104	3945.5 175,976	2.28 0.64

Undesired		Total IX		Unique IX	Prcnt Unique IX
DWAZH-CD D14 LD APP	5.0	277	5.0	277	0.12 0.16
WRAZ D15 DT CP	1.0	0	0.0	0	0.00 0.00
WPSU-TV D15 DD LIC	2.0	0	2.0	0	0.05 0.00
WFDC-DT D15 DT LIC	76.1	851	61.1	851	1.51 0.48
WUDW-LD D15 LD CP	23.1	0	5.0	0	0.12 0.00
WVAW-LD D16 LD LIC	4.0	0	0.0	0	0.00 0.00

Interference to proposal scenario 4

**MX: 2.91% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WHSV-TV	D15	LD	APP	Broadway, VA	WHSV-TV DRT-15 Mod-ERI	
Undesireds:	DWAZH-CD	D14	LD	APP	HARRISONBURG, VA	BDCCDTL20131227ADS	63.1 km
	WRAZ	D15	DT	CP	RALEIGH, NC	BLANK0000034036	327.7
	WPSU-TV	D15	DD	LIC	CLEARFIELD, PA	BLANK0000041206	282.2
	WFDC-DT	D15	DT	LIC	ARLINGTON, VA	BLANK0000066865	162.1
	WUDW-LD	D15	LD	CP	CROZET, VA	BLANK0000066865	166.7
	WVAW-LD	D16	LD	LIC	CHARLOTTESVILLE, VA	BLDTL20090218AEG	78.5

Service area	Terrain-limited	IX-free	Percent IX
5543.8 219,521	4037.7 177,104	3868.7 171,958	4.19 2.91

Undesired		Total IX		Unique IX	Prcnt Unique IX
DWAZH-CD D14 LD APP	99.8	4,454	81.8	4,295	2.03 2.43
WRAZ D15 DT CP	1.0	0	0.0	0	0.00 0.00
WPSU-TV D15 DD LIC	2.0	0	2.0	0	0.05 0.00
WFDC-DT D15 DT LIC	76.1	851	44.1	692	1.09 0.39
WUDW-LD D15 LD CP	23.1	0	5.0	0	0.12 0.00
WVAW-LD D16 LD LIC	4.0	0	0.0	0	0.00 0.00

Channel and Facility Information

Section	Question	Response
Proposed Community of License	Facility ID	4688
	State	Virginia
	City	Broadway
	DRT Channel	15

Antenna Location Data

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	No
	ASR Number	
Coordinates (NAD83)	Latitude	38° 36' 29.3" N+
	Longitude	078° 54' 08.7" W-
	Structure Type	LTOWER-Lattice Tower
	Overall Structure Height	48.7 meters
	Support Structure Height	48.7 meters
	Ground Elevation (AMSL)	655.3 meters
Antenna Data	Height of Radiation Center Above Ground Level	35 meters
	Height of Radiation Center Above Mean Sea Level	690.3 meters
	Effective Radiated Power	15 kW

Antenna
Technical Data

Section	Question	Response
Antenna Type	Antenna Type	Directional Custom
	Do you have an Antenna ID?	No
	Antenna ID	
Antenna Manufacturer and Model	Manufacturer:	ERI
	Model	ETU4U4-ES2PC-15
	Rotation	0 degrees
	Electrical Beam Tilt	1.0
	Mechanical Beam Tilt	Not Applicable
	toward azimuth	
	Polarization	Elliptical
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

Directional Antenna Relative Field Values (Pre-rotated Pattern)

Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)	Degree	V _A (Authorized Value)
0	0.060	90	0.900	180	0.960	270	0.020
10	0.150	100	0.790	190	0.860	280	0.020
20	0.270	110	0.850	200	0.720	290	0.020
30	0.430	120	0.950	210	0.530	300	0.010
40	0.610	130	0.900	220	0.370	310	0.010
50	0.780	140	0.770	230	0.220	320	0.020
60	0.900	150	0.810	240	0.110	330	0.020
70	0.980	160	0.950	250	0.040	340	0.010
80	0.990	170	1.000	260	0.010	350	0.010

Additional Azimuths

Degree	V _A
76	1.000
257	0.010
123	0.960