

ENGINEERING EXHIBIT

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

prepared for

Hearst Properties Inc.
WESH DRT Orange City, FL
Facility ID 25738
Ch. 18 (digital) 15 kW

Hearst Properties Inc. (“*Hearst*”) is the licensee of television station WESH(DT), Daytona Beach FL, Facility ID 25738. WESH’s operation includes a Digital Replacement Translator (“DRT”) facility on Channel 18 (BLCDT-20130722ABS) to aid in serving Orange City, FL and other nearby communities.

Hearst is authorized by Construction Permit (“CP”, LMS file# 0000059617) to make a minor modification of the WESH Channel 18 DRT to change its directional antenna pattern and increase effective radiated power (“ERP”). Pursuant to DA 17-442¹, the purpose of the CP was to avoid displacement by television stations that were reassigned in the incentive auction. *Hearst* herein seeks to modify the CP to specify reduced antenna height and an alternate directional antenna and associated pattern. No change in channel or site location is proposed.

The existing WESH DRT tower structure is associated with FCC Antenna Structure Registration number 1041193. No change to the overall structure height is proposed.

The proposed transmitting antenna is a side-mounted ERI model ALP8L4-HSER-18 having horizontal polarization. This is the same antenna as presently licensed, and will be centered 158.2 meters above ground level (a reduction from the presently licensed antenna height

¹*The Incentive Auction Task Force and Media Bureau Announce Procedures for Low Power Television, Television Translator and Replacement Translator Stations During the Post-Incentive Auction Transition*, Public Notice, DA 14-442, released May 12, 2017, at para. 13.

of 467 meters AGL). A plot of the directional antenna's azimuthal pattern is supplied in Figure 1.

The proposed ERP is 15 kW using a "full service" out of channel emission mask. Figure 2 depicts the 51 dBμ coverage contours of the proposed and licensed facilities. The service area overlap demonstrates compliance with §73.3572 for a minor change. The proposed DRT coverage contour does not extend beyond WESH's former analog Grade B contour.

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 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 station except with respect to the facility described below which does not present a conflict for the proposed DRT modification.

7.74 percent interference to file# 0000064337 (CP, WMOR-TV Ch. 18 Lakeland, FL):
Hearst is also the licensee for WMOR-TV and consents to the 7.74 percent predicted interference which would be caused by the WESH DRT facility proposed herein. According to FCC TVStudy analysis, the interference would occur at locations beyond WMOR-TV's DMA (Tampa-St. Petersburg / Sarasota, FL). Considering all contributors, the resulting total interference received by WMOR-TV is 9.96 percent.

A statement of consent by *Hearst* to the interference caused to WMOR-TV is provided as a separate attachment. Accordingly, the instant proposal complies with §74.793 regarding interference protection to digital television, low power television, television translator, and Class A television facilities.

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.

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 30 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 $1.8 \mu\text{W}/\text{cm}^2$, which is 0.6 percent of the general population/uncontrolled maximum permitted exposure limit. This is well 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 change in structure height is proposed.

List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Coverage Contour Comparison
Table 1	OET Bulletin 69 Interference Study
Form 2100	Engineering Data for FCC Form 2100

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	July 31, 2019	
207 Old Dominion Road	Yorktown, VA 23692	703-650-9600

AZIMUTH PATTERN**Type:****ALP-ER****Directivity:****Numeric**
1.93**dBd**
2.86**Peak(s) at:****Channel:****18****Location:****DRT - Orange City FL****Polarization:****Horizontal**

Note: Pattern shape and directivity may vary with channel and routing configuration.

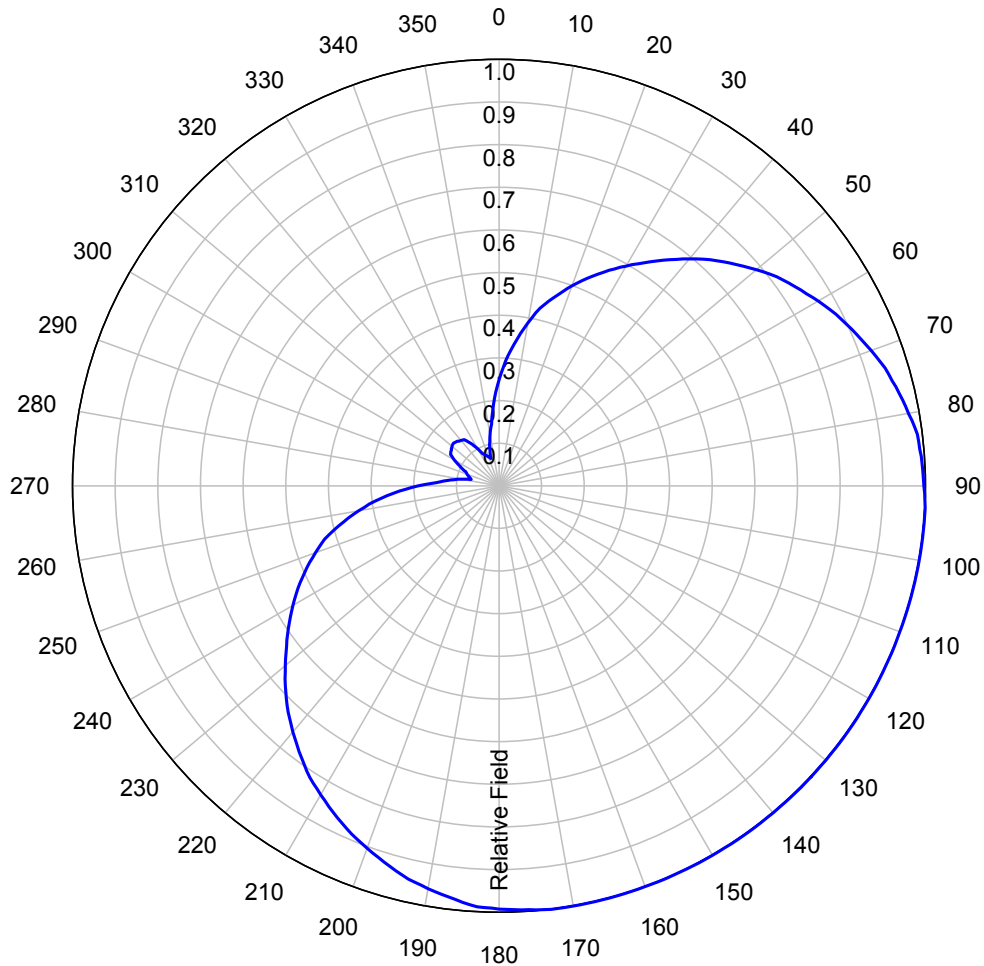
*Preliminary, subject to final design and review.***ELECTRONICS RESEARCH, INC. ERI**

Figure 1
Antenna Azimuthal Pattern
WESH DRT Orange City, FL
Facility ID 25738
Ch. 18 (digital) 15 kW

prepared for
Hearst Properties Inc.

July, 2019

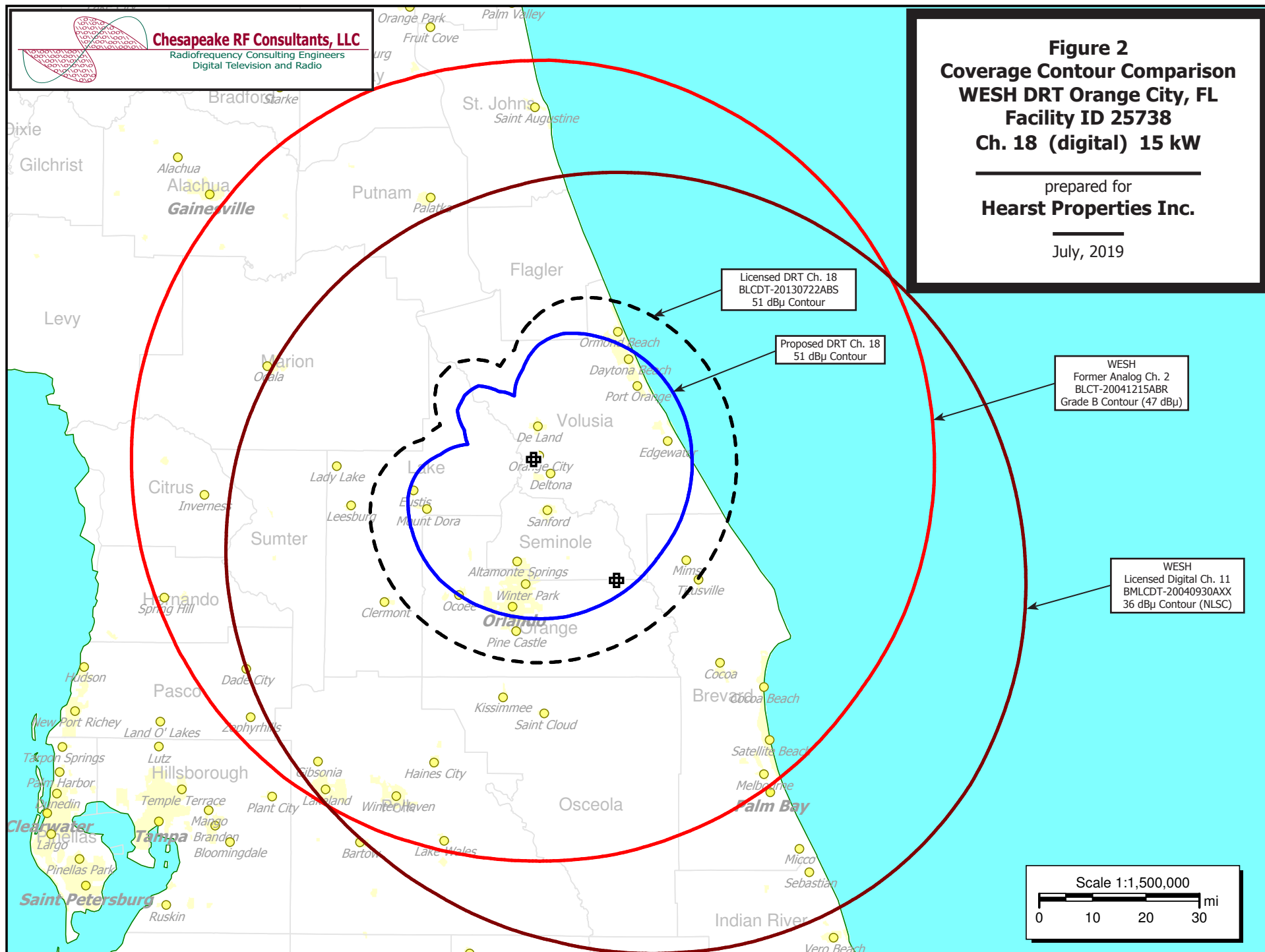


Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 2
Coverage Contour Comparison
WESH DRT Orange City, FL
Facility ID 25738
Ch. 18 (digital) 15 kW

prepared for
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Licensed DRT Ch. 18
BLCDT-20130722ABS
51 dBu Contour

Proposed DRT Ch. 18
51 dBu Contour

WESH
Former Analog Ch. 2
BLCT-20041215ABR
Grade B Contour (47 dBu)

WESH
Licensed Digital Ch. 11
BMLCDT-20040930AXX
36 dBu Contour (NLSC)

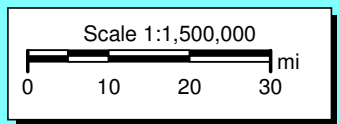


Table 1 WESH DRT TVStudy Analysis of Proposal (page 1 of 3)



tvstudy v2.2.5 (4uoc83)
Database: localhost, Study: WESH ERI-ER 519-ft, Model: Longley-Rice
Start: 2019.07.29 11:39:06

Study created: 2019.07.29 11:39:06

Study build station data: LMS TV 2019-07-29

Proposal: WESH D18 LD APP Orange City, FL
File number: WESH ERI-ER 519-ft
Facility ID: 25738
Station data: User record
Record ID: 2783
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	WVCI-LP	N16+	TX	LIC	ORLANDO, FL	BLTTL20030522AGC	39.6 km
No	WKCF	D17	DT	LIC	CLERMONT, FL	BLCDT20020718AAR	45.1
Yes	WPXB-LD	D17	LD	CP	DAYTONA BEACH, FL	BLANK0000072059	30.4
No	WODH-LD	D17	LD	LIC	GAINESVILLE, FL	BLANK0000004250	151.7
No	DWHRT-LD	D17z	LD	APP	SEBRING, ETC., FL	BLANK0000013279	160.8
No	WFTS-TV	D17	DT	CP	TAMPA, FL	BLANK0000034831	152.9
No	WTCE-TV	D18	DT	LIC	FORT PIERCE, FL	BLANK0000072132	240.1
Yes	WJXT	D18	DT	CP	JACKSONVILLE, FL	BLANK0000034420	150.2
No	WUJX-LD	D18	LD	LIC	JACKSONVILLE, FL	BLDTL20150220AAS	151.3
Yes	WMOR-TV	D18	DT	CP	LAKELAND, FL	BLANK0000064337	154.9
No	W17DG-D	D18	LD	CP	MIAMI, FL	BLANK0000053955	346.1
No	W17DG-D	D18	LD	CP	MIAMI, FL	BLANK0000071664	346.2
No	WTXI-LD	D18	LD	APP	MIAMI, FL	BLANK0000068071	346.2
No	NEW	D18	LD	APP	MONTICELLO, FL	BNPDTL20090825BMH	307.9
No	WUVF-LD	D18	LD	CP	NAPLES, FL	BLANK0000078135	291.2
No	WUVF-LD	D18	LD	LIC	NAPLES, FL	BLDTL20140313ABX	295.0
Yes	WQFT-LD	D18	LD	LIC	OCALA, FL	BLANK0000022525	76.2
No	NEW	D18	LD	APP	QUINCY, FL	BNPDTL20090825AMN	363.0
No	W18EA-D	D18	LD	CP	SEBASTIAN, FL	BNPDTL20100402ACV	155.9
No	NEW	D18	LD	APP	TALLAHASSEE, FL	BNPDTL20090825BIA	334.6
No	NEW	D18	LD	APP	TALLAHASSEE, FL	BNPDTL20090825ALY	334.6
No	WSVT-LD	D18	DC	LIC	TAMPA, FL	BLDTA20110413AAM	154.9
No	W18ED-D	D18	LD	CP	CHULA, GA	BNPDTL20100510ABF	359.9
No	WUET-LD	D18	LD	CP	SWAINSBORO, GA	BLANK0000052865	347.0
No	WUET-LD	D18	LD	APP	SWAINSBORO, GA	BLANK0000078554	351.1
No	NEW	D18	LD	APP	VALDOSTA, GA	BNPDTL20090825AHG	284.8
No	WESH	D19	LD	LIC	DAYTONA BEACH, FL	BLANK0000074849	87.5
No	WESH	D19	LD	CP	DAYTONA BEACH, FL	BLANK0000053908	87.5
No	NEW	D19	LD	APP	GAINESVILLE, FL	BNPDTL20090825ANR	131.1
No	WJAX-TV	D19	DT	LIC	JACKSONVILLE, FL	BLCDT20030328ANV	151.3
No	WMOR-TV	D19	DT	LIC	LAKELAND, FL	BLCDT20050726ABO	154.9
No	W32DJ-D	D19	LD	CP	MELBOURNE, FL	BLANK0000052050	107.2
No	WFTV	D19	LD	CP	ORLANDO, FL	BLANK0000053175	26.0
No	WTOG	D19	DT	CP	ST. PETERSBURG, FL	BLANK0000064125	154.3
No	WMMF-LP	D19+	LD	CP	VERO BEACH, FL	BLANK0000069146	179.5
No	WMMF-LP	N19+	TX	LIC	VERO BEACH, FL	BLTTL20070912ABV	173.8
No	W21AU-D	N21+	TX	LIC	ORLANDO, FL	BLTTL19920715IB	39.3

No non-directional AM stations found within 0.8 km

No directional AM stations found within 3.2 km

Record parameters as studied:

Channel: D18
Mask: Full Service
Latitude: 28 56 16.00 N (NAD83)
Longitude: 81 18 57.00 W
Height AMSL: 178.9 m

Table 1 WESH DRT TVStudy Analysis of Proposal
(page 2 of 3)



HAAT: 0.0 m
Peak ERP: 15.0 kW
Antenna: ERI ALP-ER 133.0 deg
Elev Pattn: Generic
Elec Tilt: 1.00

49.1 dBu contour:

Azimuth	ERP	HAAT	Distance
0.0 deg	0.929 kW	160.2 m	35.3 km
45.0	8.28	162.1	46.7
90.0	14.9	164.6	49.8
135.0	15.0	166.0	49.9
180.0	14.7	167.1	49.9
225.0	7.45	176.1	47.0
270.0	0.542	170.3	33.1
315.0	0.315	175.7	30.7

Database HAAT does not agree with computed HAAT
Database HAAT: 0 m Computed HAAT: 168 m

Distance to Canadian border: 1419.3 km

Distance to Mexican border: 1573.0 km

Conditions at FCC monitoring station: Vero Beach FL
Bearing: 155.6 degrees Distance: 162.3 km

Proposal is not within the West Virginia quiet zone area

Conditions at Table Mountain receiving zone:
Bearing: 306.1 degrees Distance: 2505.6 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 BLANK0000072059 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance		
	WPXB-LD	D17	LD	CP	DAYTONA BEACH, FL	BLANK0000072059			
Undesireds:	WESH	D18	LD	APP	Orange City, FL	WESH ERI-ER 519-ft	30.4 km		
	WFTS-TV	D17	DT	CP	TAMPA, FL	BLANK0000034831	183.2		
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX		
5893.9 571,894		5893.9 571,894		5892.9 571,894		5871.6 563,388	0.36 1.49		
Undesired				Total IX	Unique IX, before	Unique IX, after			
WESH D18 LD APP				22.3 8,506	21.3 8,506				
WFTS-TV D17 DT CP				1.0 0	1.0 0	0.0 0			

Interference to BLANK0000034420 CP scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WJXT	D18	DT	CP	JACKSONVILLE, FL	BLANK0000034420	
Undesireds:	WESH	D18	LD	APP	Orange City, FL	WESH ERI-ER 519-ft	150.2 km
	WMOR-TV	D18	DT	CP	LAKELAND, FL	BLANK0000064337	281.3
	WJAX-TV	D19	DT	LIC	JACKSONVILLE, FL	BLCDT20030328ANV	1.8
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
27968.7 1,623,459		27968.7 1,623,459		27685.6 1,616,535		27603.8 1,609,714	0.30 0.42

Table 1 WESH DRT TVStudy Analysis of Proposal
(page 3 of 3)



Undesired		Total IX	Unique IX, before	Unique IX, after
WESH D18 LD APP	84.8	7,021		81.8 6,821
WMOR-TV D18 DT CP	282.1	6,924	281.1 6,924	278.1 6,724
WJAX-TV D19 DT LIC	2.0	0	1.0 0	1.0 0

Interference to BLANK0000064337 CP scenario 1

**IX: 7.74% interference caused

WMOR-TV accepts 7.74 percent interference to Construction Permit facility

	Call	Chan	Svc	Status	City, State	File Number	Distance		
Desired:	WMOR-TV	D18	DT	CP	LAKELAND, FL	BLANK0000064337			
Undesireds:	WESH	D18	LD	APP	Orange City, FL	WESH ERI-ER 519-ft	154.9 km		
	WFTS-TV	D17	DT	CP	TAMPA, FL	BLANK0000034831	2.5		
	WTCE-TV	D18	DT	LIC	FORT PIERCE, FL	BLANK0000072132	223.6		
	WJXT	D18	DT	CP	JACKSONVILLE, FL	BLANK0000034420	281.3		
	WTOG	D19	DT	CP	ST. PETERSBURG, FL	BLANK0000064125	1.2		
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX		
42073.8	5,398,262	42067.8	5,397,856	40875.7	5,267,620	40042.9	4,860,009	2.04	7.74
Total interference: 9.69%									

Undesired		Total IX	Unique IX, before	Unique IX, after
WESH D18 LD APP	1276.6	509,437		832.8 407,611
WFTS-TV D17 DT CP	16.9	723	12.9 723	12.9 723
WTCE-TV D18 DT LIC	842.0	34,926	738.6 19,305	583.5 9,934
WJXT D18 DT CP	435.7	109,967	330.3 94,346	140.0 16,713
WTOG D19 DT CP	5.0	241	3.0 241	3.0 241

Interference to BLANK0000022525 LIC scenario 1

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WQFT-LD	D18	LD	LIC	OCALA, FL	BLANK0000022525	
Undesireds:	WESH	D18	LD	APP	Orange City, FL	WESH ERI-ER 519-ft	76.2 km
	WJXT	D18	DT	CP	JACKSONVILLE, FL	BLANK0000034420	148.4
	WMOR-TV	D18	DT	CP	LAKELAND, FL	BLANK0000064337	134.8
	WUVF-LD	D18	LD	CP	NAPLES, FL	BLANK0000078135	300.5
	WESH	D19	LD	LIC	DAYTONA BEACH, FL	BLANK0000074849	23.6
Service area		Terrain-limited		IX-free, before		IX-free, after	Percent New IX
558.9 129,667		558.9 129,667		408.7 101,913		407.7 101,913	0.25 0.00
Undesired		Total IX	Unique IX, before	Unique IX, after			
WESH D18 LD APP	5.1	463		1.0 0			
WJXT D18 DT CP	8.1	0	0.0 0	0.0 0			
WMOR-TV D18 DT CP	150.2	27,754	142.1 27,754	138.0 27,291			

Interference to proposal scenario 1

10.80% interference received

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance
	WESH	D18	LD	APP	Orange City, FL	WESH ERI-ER 519-ft	
Undesireds:	WPXB-LD	D17	LD	CP	DAYTONA BEACH, FL	BLANK0000072059	30.4 km
	WJXT	D18	DT	CP	JACKSONVILLE, FL	BLANK0000034420	150.2
	WMOR-TV	D18	DT	CP	LAKELAND, FL	BLANK0000064337	154.9
	W17DG-D	D18	LD	CP	MIAMI, FL	BLANK0000053955	346.1
	WUVF-LD	D18	LD	CP	NAPLES, FL	BLANK0000078135	291.2
	WESH	D19	LD	LIC	DAYTONA BEACH, FL	BLANK0000074849	87.5
Service area		Terrain-limited		IX-free		Percent IX	
5859.8 1,702,598		5859.8 1,702,598		5403.8 1,518,669		7.78 10.80	
Undesired		Total IX	Unique IX	Prcnt Unique IX			
WPXB-LD D17 LD CP	109.2	39,206	94.1 31,690	1.61 1.86			
WJXT D18 DT CP	12.1	1,085	10.1 0	0.17 0.00			
WMOR-TV D18 DT CP	351.8	152,239	334.6 143,638	5.71 8.44			

**Channel and
Facility
Information**

Section	Question	Response
Proposed Community of License	Facility ID	25738
	State	Florida
	City	DAYTONA BEACH
	DRT Channel	18
	Designated Market Area	Orlando-Daytona Bch-Melbrn

**Antenna Location
Data**

Section	Question	Response
Antenna Structure Registration	Do you have an FCC Antenna Structure Registration (ASR) Number?	Yes
	ASR Number	1041193
Coordinates (NAD83)	Latitude	28° 56' 16.0" N+
	Longitude	081° 18' 57.0" W-
	Structure Type	TOWER-A free standing or guyed struct
	Overall Structure Height	510.5 meters
	Support Structure Height	480.2 meters
	Ground Elevation (AMSL)	20.7 meters
Antenna Data	Height of Radiation Center Above Ground Level	158.2 meters
	Height of Radiation Center Above Mean Sea Level	178.9 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	ALP8L4-HSER-18
	Rotation	133 degrees
	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

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	1	90	0.725	180	0.147	270	0.725
10	1	100	0.624	190	0.136	280	0.815
20	1	110	0.529	200	0.085	290	0.886
30	1	120	0.428	210	0.067	300	0.946
40	1	130	0.293	220	0.146	310	0.988
50	0.988	140	0.146	230	0.293	320	1
60	0.946	150	0.067	240	0.428	330	1
70	0.886	160	0.085	250	0.529	340	1
80	0.815	170	0.136	260	0.624	350	1

Additional Azimuths

Degree	V _A
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