

## **ENGINEERING EXHIBIT**

### **Application for Construction Permit New Replacement Digital Television Translator**

prepared for

#### **WGAL Hearst-Argyle Television, Inc.**

WGAL(DT) Lancaster, PA  
Replacement Digital Translator  
Harrisburg, PA Ch. 43 15 kW

*WGAL Hearst-Argyle Television, Inc.* (“*Hearst-Argyle*”) is the licensee of television station WGAL, Facility ID 53930, Lancaster, PA. WGAL is operating on its post-transition digital Channel 8, its pre-transition analog channel. Pursuant to the procedures adopted in MB Docket 08-253,<sup>1</sup> *Hearst-Argyle* herein proposes to construct a new replacement digital television translator station on Channel 43 to aid in serving Harrisburg, PA and vicinity.

Since ceasing analog operations on the transition date, WGAL has received numerous calls regarding reception problems, including issues with indoor reception at locations within Harrisburg and vicinity. Problems with digital VHF reception by other stations have been widely publicized since the transition date. The proposed translator would provide some level of digital UHF fill-in service to aid reception in the Harrisburg area and therefore avoid loss of service resulting from the digital transition.

**Figure 1** depicts the 51 dB $\mu$  coverage contour of the proposed translator, along with the WGAL digital Channel 8 noise limited contour (BLCDT-20090804ABL pending) and the pre-transition analog Channel 8 Grade B contour (BLCT-19981009KE). The translator’s service contour will not extend beyond WGAL’s former analog Grade B contour.

The proposed digital translator facility will employ a new antenna system to be side-mounted on an existing tower structure, associated with Antenna Structure Registration number 1040042. No

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<sup>1</sup>Report and Order, *Amendment of Parts 73 and 74 of the Commission’s Rules to Establish Rules for Replacement Digital Low Power Television Translator Stations*, MB Docket 08-253, FCC 09-36, released May 8, 2009.

change to the overall structure height is proposed. The maximum effective radiated power is 15 kW utilizing a circularly polarized directional antenna.

*Hearst-Argyle* specifies use of a **full power out-of-channel emission mask** as defined in §73.622(h).<sup>2</sup> Detailed interference studies per OET Bulletin 69<sup>3</sup> show that the proposal complies with the Commission's interference protection requirements toward all post-transition digital television, television translator, LPTV, and Class A stations. The results, summarized in **Table 1**, show that any new interference does not exceed the Commission's interference limits (0.5 percent to full power and Class A stations, and 2.0 percent to secondary stations).

Accordingly, the instant proposal complies with §§73.6012 – 73.6020 regarding interference protection to digital television, low power television, television translator, Class A television, and land mobile facilities.

The proposed site is located 327 km from the U.S. – Canadian border. The worst-case 19.5 dBμ F(10,10) co-channel DTV-to-DTV interfering contour is depicted in **Figure 2** and does not extend across the border. Thus it is believed that the instant proposal complies with all international agreements at this time.

The nearest FCC monitoring station is 131 km distant at Laurel, MD. This exceeds 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 AM stations within 3.2 kilometers of the site, based on information contained within the Commission's database.

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<sup>2</sup>If needed, a waiver of §74.793(c) is requested to allow use of the full power emission mask.

<sup>3</sup>FCC Office of Engineering and Technology Bulletin number 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference*, February 6, 2004 (“OET-69”). The implementation of OET-69 for this study followed the guidelines of OET-69 as specified therein. A cell size of 1 km was employed. Comparisons of various results of this computer program (run on a Sun Sparc processor) to the Commission's implementation of OET-69 show excellent correlation.

### **Human Exposure to Radiofrequency Electromagnetic Field (Environmental)**

The proposed transmitting antenna will be side-mounted on an existing antenna support structure. The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules.

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the Commission's OET Bulletin Number 65. Based on OET-65 equation (10), and considering 25 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  $2.2 \mu\text{W}/\text{cm}^2$ , 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.

### **Certification**

The undersigned hereby certifies that the foregoing statement and associated attachments were prepared by him or under his direction, and that they are true and correct to the best of his knowledge and belief.



Joseph M. Davis, P.E.  
August 23, 2009

**Chesapeake RF Consultants, LLC**  
11993 Kahns Road  
Manassas, VA 20112  
703-650-9600

### List of Attachments

Figure 1	Coverage Contour Comparison
Table 1	Interference Analysis Results Summary
Figure 2	Interfering Contour to Canada
Form 346	Saved Version of Engineering Sections from FCC Form at Time of Upload

*This material was entered August 23, 2009 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.*

prepared for  
**WGAL Hearst-Argyle  
Television, Inc.**

August, 2009

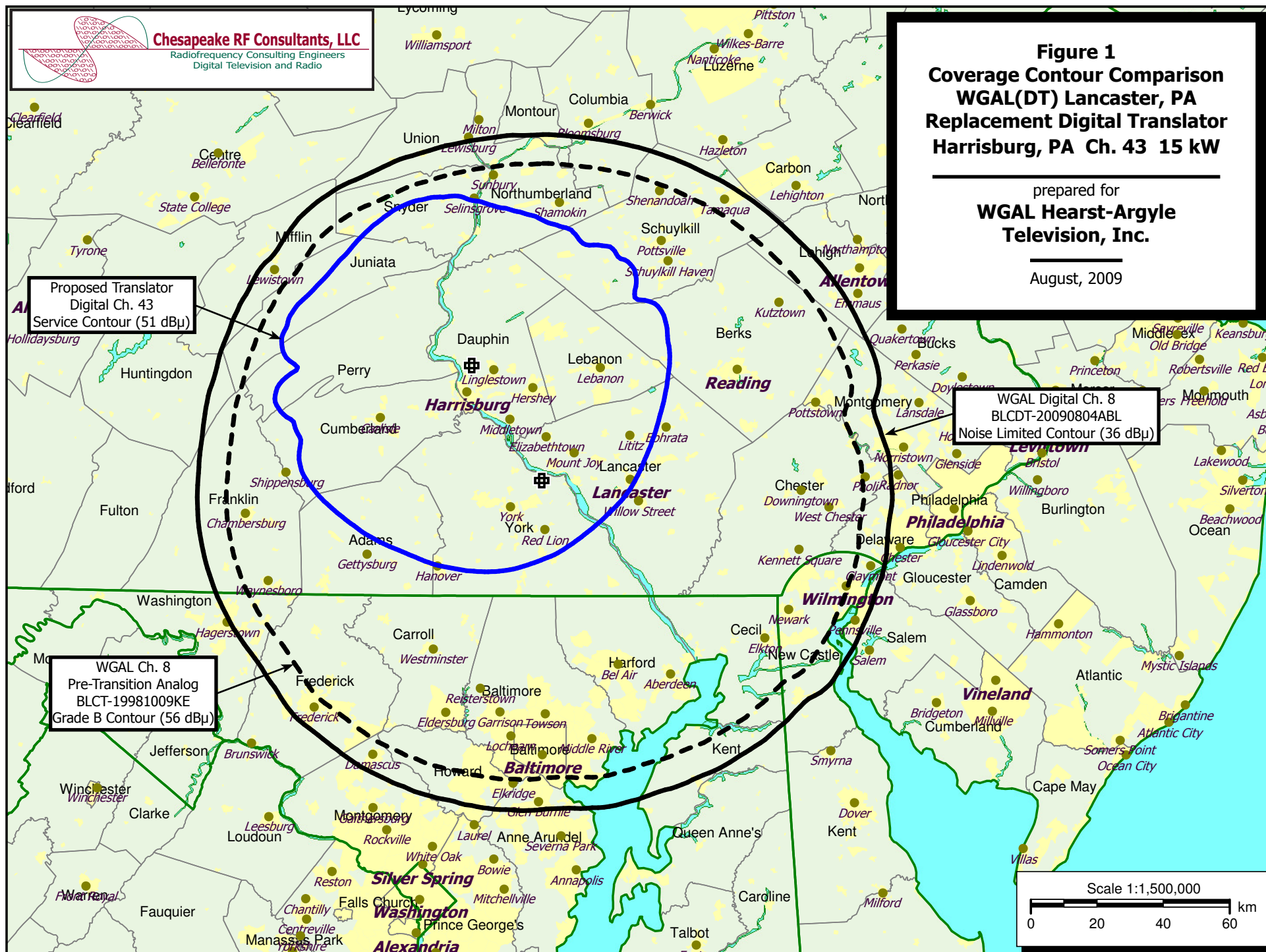


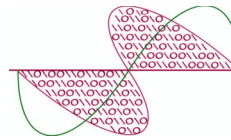
Table 1

**Interference Analysis Results Summary**

prepared for

**WGAL Hearst-Argyle Television, Inc.**

Replacement Digital Translator Ch. 43 Harrisburg, PA

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

NEW-LD	USERRECORD-01	COMMUNITY	PA US
Channel 43 ERP 15.	kW HAAT 385. m	RCAMSL 00569 m	<b>FULL SERVICE MASK</b>
Latitude 040-20-44 Longitude 0076-52-07			
Dir Antenna Make usr Model DIE DSB-H Beam tilt N Ref Azimuth 160.			

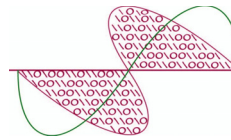
Ch.	Call	City/State	Dist (km)	Status	Application Ref. No.	---Population (2000 Census)---	
						Baseline	New Interference
28	W61AG	POTTSVILLE PA	67.5	CP	BDISTTL-20080125AAK	---	none
29	WHVL-LP	STATE COLLEGE, ETC. PA	113.0	LIC	BLTTL-19911123JH	---	none
35	W35BT	DILLSBURG PA	12.6	LIC	BLTTL-20031121AJD	---	none
35	WYLN-LP	HAZLETON PA	103.5	LIC	BLTTL-19950324IE	---	none
36	W36BE	STATE COLLEGE PA	95.8	LIC	BLTTL-19901210JO	---	none
39	W39BT	WILLIAMSPORT PA	97.3	LIC	BLTT-19950109JC	---	none
40	W40AZ	WILMINGTON DE	129.2	LIC	BLTT-19931117JC	---	none
41	W41CF	ALTOONA PA	135.4	LIC	BLTT-20000403ABN	---	none
42	WMPT	ANNAPOLIS MD	150.1	CP	BPEDT-20080620AIA	---	none
42	WMPT	ANNAPOLIS MD	150.1	LIC	BLEDT-20030903ABC	---	none
42	W42CK	HAGERSTOWN MD	112.8	LIC	BLTTL-19991020AAP	---	none
42	WSKG-TV	BINGHAMTON NY	205.7	LIC	BLEDT-20050526ACA	---	none
42	WTFX-TV	PHILADELPHIA PA	142.5	APP	BMPCDT-20080616AAQ	---	none
42	WTFX-TV	PHILADELPHIA PA	142.5	CP MOD	BMPCDT-20090520AGI	---	none
42	WTFX-TV	PHILADELPHIA PA	142.5	LIC	BLCDDT-20070914AAK	---	none
42	W42DG-D	STATE COLLEGE PA	95.8	LIC	BLDTL-20071109AAR	---	none
42	WHSV-TV	HARRISONBURG VA	198.4	APP	BDRTCT-20090401APJ	---	none
43	WIAV-LD	WASHINGTON DC	150.5	APP	BDISDTL-20090428AAY	---	none
43	W43BP	CRESAPTOWN MD	192.6	LIC	BLTT-19981124JI	---	none
43	W42CK	HAGARSTOWN MD	112.8	APP	BDISDTL-20090812AAO	208,362	369 (0.18%)
43	W43CH	BELVIDERE NJ	159.5	LIC	BLTT-20060622AAE	---	none
43	W43CH	BELVIDERE NJ	159.5	CP	BDFCDTT-20061010AET	358,814	445 (0.12%)
43	WNJT	TRENTON NJ	185.1	LIC	BLEDT-20030411AAE	8,552,019	14,642 (0.17%)
43	WNJT	TRENTON NJ	185.1	CP	BPEDT-20080620AGH	8,935,405	22,028 (0.25%)
43	WNED-TV	BUFFALO NY	343.5	LIC	BLEDT-20030812AAJ	---	none
43	WNXY-LP	NEW YORK NY	251.0	CP MOD	BMPDTL-20081202AEM	---	none
43	WNXY-LP	NEW YORK NY	251.0	CP MOD	BMPDTL-20080805AAW	---	none
43	WNXY-LP	NEW YORK NY	251.0	CP	BDISDTL-20080505AAS	---	none
43	W43CN-D	PORT JERVIS NY	232.2	CP MOD	BMPDTL-20080325AIB	---	none
43	WCWN	SCHENECTADY NY	347.6	CP	BPCDT-20080620ABN	---	none
43	WCWN	SCHENECTADY NY	347.6	LIC	BLCDDT-20050623ABN	---	none



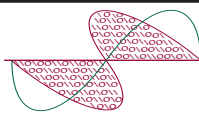
Table 1

**Interference Analysis Results Summary**

(page 2 of 2)

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

<u>Ch.</u>	<u>Call</u>	<u>City/State</u>	<u>Dist</u>	<u>Status</u>	<u>Application Ref. No.</u>	<u>---Population (2000 Census)---</u>	
			<u>(km)</u>			<u>Baseline</u>	<u>New Interference</u>
43	WLEP-LD	ERIE PA	326.3	CP	BDCCDTL-20061024AER	---	none
43	WLEP-LD	ERIE PA	326.6	APP	BMPDTL-20090805ACG	---	none
43	W43CO-D	KINGSTON PA	135.6	CP	BDCCDTL-20061030AGG	453,868	3,170 (0.70%)
43	WPGH-TV	PITTSBURGH PA	265.9	CP MOD	BMPCDT-20021216AAS	3,093,507	38 (0.00%)
43	WPGH-TV	PITTSBURGH PA	265.9	LIC	BLCDDT-20021216AAT	3,093,507	38 (0.00%)
43	WTLU-LD	LYNCHBURG VA	386.6	APP	BMPDTL-20090702ACM	---	none
43	WTLU-LD	LYNCHBURG VA	386.6	CP MOD	BMPDTL-20080804ABZ	---	none
43	WAZM-LD	STAUNTON-WAYNESBORO VA	271.7	CP	BDCCDTL-20061030AAA	---	none
43	WBTD-LD	SUFFOLK VA	393.0	CP	BDCCDTL-20061020ACR	---	none
43	W43CL	PENDLETON WV	268.5	CP	BNPTTL-20000828AED	---	none
44	WIAV-LD	WASHINGTON DC	157.3	CP MOD	BMPDTL-20090630ADG	---	none
44	WWPB	HAGERSTOWN MD	121.5	LIC	BLEDT-20031029ACE	958,253	122 (0.01%)
44	WWPB	HAGERSTOWN MD	121.5	CP	BPEDT-20080620ANI	1,554,107	1,240 (0.08%)
44	WMCN-TV	ATLANTIC CITY NJ	185.4	LIC	BLCDDT-20060707ACS	---	none
44	WVIA-TV	WAYMART PA	187.3	APP	BDRDET-20090430ABG	---	none
46	W46BL	ALLENTOWN-BETHLEHEM PA	123.2	LIC	BLTT-19990325JE	---	none
47	W47AO	BERWICK PA	91.8	LIC	BLTT-19940815IF	---	none
50	W50DE	MARTINSBURG WV	141.6	LIC	BLTT-20040510ABB	---	none
51	W51CY	CHAMBERSBURG PA	90.7	LIC	BLTT-20020812ACR	---	none



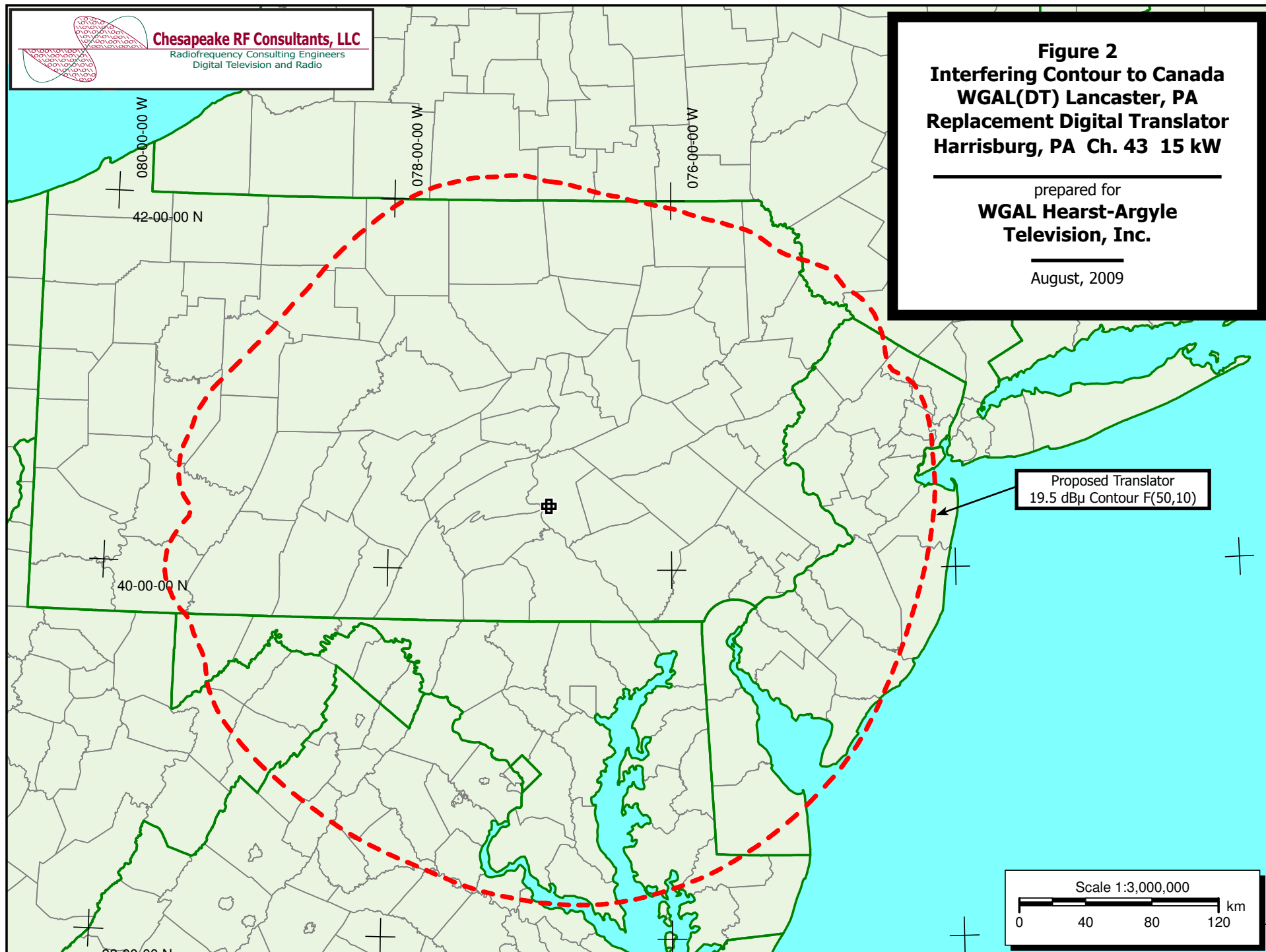
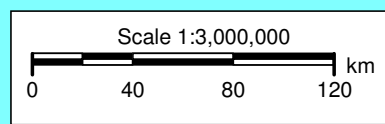
**Chesapeake RF Consultants, LLC**  
Radiofrequency Consulting Engineers  
Digital Television and Radio

**Figure 2**  
**Interfering Contour to Canada**  
**WGAL(DT) Lancaster, PA**  
**Replacement Digital Translator**  
**Harrisburg, PA Ch. 43 15 kW**

prepared for  
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**Television, Inc.**

August, 2009

Proposed Translator  
19.5 dBμ Contour F(50,10)





**SECTION III - ENGINEERING DATA (Digital)****TECHNICAL SPECIFICATIONS**

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

**TECH BOX**

1.	Channel Number: 43																																																																																				
2.	Translator Input Channel No. : 8																																																																																				
3.	Primary station proposed to be rebroadcast: <table border="1"><tr><td>Facility Identifier</td><td>Call Sign</td><td>City</td><td>State</td><td>Channel</td></tr><tr><td>53930</td><td>WGAL</td><td>LANCASTER</td><td>PA</td><td>8</td></tr></table>	Facility Identifier	Call Sign	City	State	Channel	53930	WGAL	LANCASTER	PA	8																																																																										
Facility Identifier	Call Sign	City	State	Channel																																																																																	
53930	WGAL	LANCASTER	PA	8																																																																																	
4.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 40 Minutes 20 Seconds 44 <input checked="" type="radio"/> North <input type="radio"/> South  Longitude: Degrees 76 Minutes 52 Seconds 07 <input checked="" type="radio"/> West <input type="radio"/> East																																																																																				
5.	Antenna Structure Registration Number: 1040042 <input type="checkbox"/> Not Applicable [Exhibit 10] <input type="checkbox"/> Notification filed with FAA																																																																																				
6.	Antenna Location Site Elevation Above Mean Sea Level: 399.3 meters																																																																																				
7.	Overall Tower Height Above Ground Level: 221.6 meters																																																																																				
8.	Height of Radiation Center Above Ground Level: 170 meters																																																																																				
9.	Maximum Effective Radiated Power (ERP): 15 kW																																																																																				
10.	Transmitter Output Power: 4.3 kW																																																																																				
11.	a. Transmitting Antenna: Before selecting Directional "Off-the-Shelf", refer to "Search for Antenna Information" under <a href="http://fjallfoss.fcc.gov/prod/cdbs/pubacc/prod/cdbs_pa.htm">CDBS Public Access</a> (http://fjallfoss.fcc.gov/prod/cdbs/pubacc/prod/cdbs_pa.htm). Make sure that the Standard Pattern is marked Yes and that the relative field values shown match your values. Enter the Manufacturer (Make) and Model exactly as displayed in the Antenna Search. <input type="radio"/> Nondirectional <input type="radio"/> Directional "Off-the-shelf" <input checked="" type="radio"/> Directional composite  Manufacturer DIE Model TFU-8DSB-H CIRCULARLY POLARIZED  b. Electrical Beam Tilt: 2.0 degrees <input type="checkbox"/> Not Applicable  c. Directional Antenna Relative Field Values: <input type="checkbox"/> N/A (Nondirectional or Directional "Off-the-shelf") Rotation (Degrees): <input checked="" type="checkbox"/> No Rotation <table border="1"><thead><tr><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th></tr></thead><tbody><tr><td>0</td><td>0.477</td><td>10</td><td>0.446</td><td>20</td><td>0.468</td><td>30</td><td>0.560</td><td>40</td><td>0.688</td><td>50</td><td>0.810</td></tr><tr><td>60</td><td>0.891</td><td>70</td><td>0.918</td><td>80</td><td>0.885</td><td>90</td><td>0.834</td><td>100</td><td>0.793</td><td>110</td><td>0.777</td></tr><tr><td>120</td><td>0.816</td><td>130</td><td>0.885</td><td>140</td><td>0.949</td><td>150</td><td>0.984</td><td>160</td><td>1.0</td><td>170</td><td>0.977</td></tr><tr><td>180</td><td>0.917</td><td>190</td><td>0.842</td><td>200</td><td>0.776</td><td>210</td><td>0.768</td><td>220</td><td>0.779</td><td>230</td><td>0.828</td></tr><tr><td>240</td><td>0.885</td><td>250</td><td>0.911</td><td>260</td><td>0.880</td><td>270</td><td>0.788</td><td>280</td><td>0.673</td><td>290</td><td>0.560</td></tr><tr><td>300</td><td>0.467</td><td>310</td><td>0.430</td><td>320</td><td>0.452</td><td>330</td><td>0.495</td><td>340</td><td>0.521</td><td>350</td><td>0.511</td></tr></tbody></table> Additional Azimuths	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	0	0.477	10	0.446	20	0.468	30	0.560	40	0.688	50	0.810	60	0.891	70	0.918	80	0.885	90	0.834	100	0.793	110	0.777	120	0.816	130	0.885	140	0.949	150	0.984	160	1.0	170	0.977	180	0.917	190	0.842	200	0.776	210	0.768	220	0.779	230	0.828	240	0.885	250	0.911	260	0.880	270	0.788	280	0.673	290	0.560	300	0.467	310	0.430	320	0.452	330	0.495	340	0.521	350	0.511
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[Relative Field Polar Plot](#)

	<b>NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.</b>
12.	<b>Out-of-channel Emission Mask:</b> <input type="radio"/> Simple <input checked="" type="radio"/> Stringent
<b>CERTIFICATION</b>	
13.	<b>Interference :</b> The proposed facility complies with all of the following applicable rule sections. 47.C.F.R Sections 74.709, 74.793(e), 74.793(f), 74.793(g), 74.793(h), 74.794(b) and 73.1030. <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> <span style="float: right;">See Explanation in [Exhibit 11]</span>
14.	<b>Environmental Protection Act.</b> The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine RF compliance, an <b>Exhibit is required.</b> <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> <span style="float: right;">See Explanation in [Exhibit 12]</span>  By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.
15.	<b>Channels 52-59.</b> If the proposed channel is within channels 52-59, the applicant certifies compliance with the following requirements, as applicable:  <input type="checkbox"/> The applicant is applying for a digital companion channel for which no suitable channel from channel 2-51 is available.

<input type="checkbox"/>	Pursuant to Section 74.786(d), the applicant has notified, within 30 days of filing this application, all commercial wireless licenses of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees.
16.	<b>Channels 60-69.</b> If the proposed channel is within channels 60-69, the applicant certifies compliance with the following requirements, as applicable:  <input type="checkbox"/> Pursuant to Section 74.786(e), the applicant has notified, within 30 days of filing this application, all commercial wireless licenses of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees.  <input type="checkbox"/> Pursuant to Section 74.786(e), the applicant proposing operation on channel 63, 64, 68 and 69 ("public safety channels") has secured a coordinated spectrum use agreements(s) with 700 MHz public safety regional planning committee(s) and state administrator(s) of the region(s) and state(s) within which the antenna site of the digital LPTV or TV translator station is proposed to locate, and those adjoining regions and states with boundaries within 75 miles of the proposed station location.  <input type="checkbox"/> Pursuant to Section 74.786(e), the applicant for a channel adjacent to channel 63, 64, 68 or 69 has notified, within 30 days of filing this application, the 700 MHz public safety regional planning committee(s) and state administrator(s) of the region and state containing the proposed digital LPTV or TV translator antenna site and regions and states whose geographic boundaries lie within 50 miles of the proposed LPTV or TV translator antenna site.
<b>PREPARERS CERTIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.</b>	

### SECTION III PREPARER'S CERTIFICATION

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name JOSEPH M. DAVIS, P.E.		Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature		Date 8/23/2009	
Mailing Address CHESAPEAKE RF CONSULTANTS, LLC 11993 KAHNS ROAD			
City MANASSAS	State or Country (if foreign address) VA		Zip Code 20112 -
Telephone Number (include area code) 7036509600		E-Mail Address (if available) JOSEPH.DAVIS@RF-CONSULTANTS.COM	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

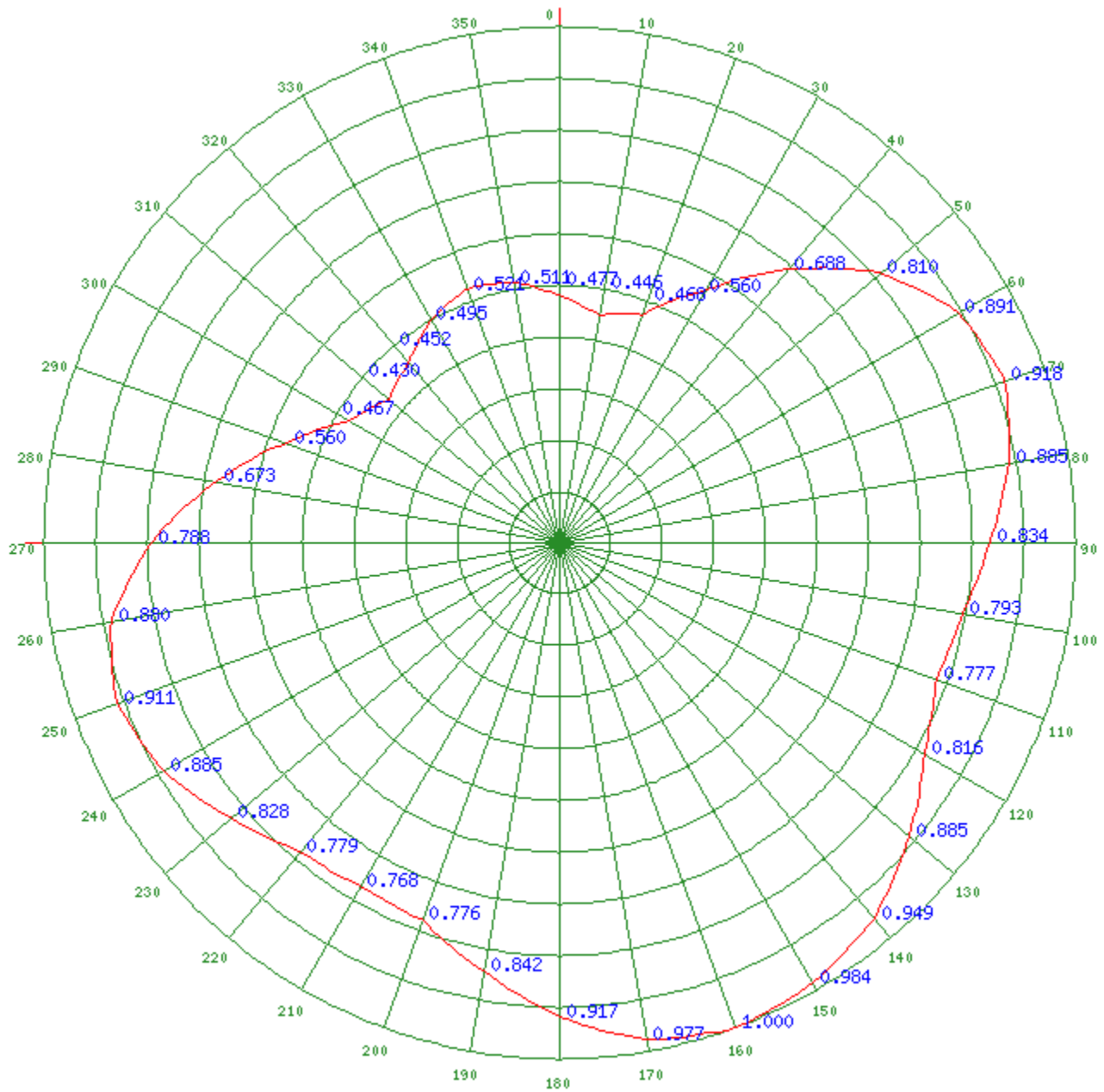
### Exhibits

#### Exhibit 11 Description:

THE APPLICANT SPECIFIES USE OF A FULL POWER OUT-OF-CHANNEL EMISSION MASK AS DEFINED IN 73.622(H). IF NEEDED, A WAIVER OF 74.793(C) IS REQUESTED TO ALLOW USE OF THE FULL POWER EMISSION MASK.

Any specified rotation has already been applied to the plotted pattern.  
Field strength values shown on a rotated pattern may differ from the listed values  
because intermediate azimuths are interpolated between entered azimuths.

Close Window



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