

ENGINEERING EXHIBIT

Application for Digital Television Station Construction Permit

prepared for

Gray Television Licensee, LLC

KKTV(DT) Colorado Springs, CO

Facility ID 35037

Ch. 49 550 kW 724 m

Gray Television Licensee, LLC (“Gray”) is licensee of KKTV(DT) Channel 10, Colorado Springs, CO. The post-transition channel allotment for KKTV was recently changed from Channel 10 to Channel 49 as described in the Commission’s Report and Order (“R&O”) in MB Docket 09-111¹. Pursuant to the R&O, *Gray* is submitting this application on FCC Form 301 to obtain a Construction Permit to specify operation on Channel 49.

As described in MB Docket 09-111, *Gray* proposes to employ a directional antenna at the existing KKTV transmitter site. The proposed antenna is an elliptically polarized ERI model ATW22HS5-ETC170-49H (30 percent vertical polarization). The maximum horizontally polarized effective radiated power (“ERP”) is 550 kW, and the maximum vertically polarized ERP is 165 kW. The vertically polarized component will not exceed the horizontally polarized component at any azimuth.

The directional antenna’s azimuthal patterns are depicted in **Figures 1** and **1A** for horizontal and vertical polarization, respectively. The antenna’s elevation pattern is depicted in **Figures 2** and **2A**. The antenna will be top-mounted on the existing KKTV antenna supporting structure, having FCC Antenna Structure Registration (“ASR”) number 1024861.

¹*Amendment of Section 73.622(i), Final DTV Table of Allotments, Television Broadcast Stations (Colorado Springs, Colorado)*, MB Docket No. 09-111, RM 11541, DA 09-1758, released August 6, 2009.

A map is supplied as **Figure 3**, which depicts the standard predicted coverage contours. This map includes the boundaries of Colorado Springs, KKTV's principal community. As demonstrated thereon, the proposed facility complies with §73.625(a)(1), as the entire principal community will be encompassed by the 48 dBμ contour.

Except for an insignificant reduction of antenna height by 1 meter (from 725 to 724 meters HAAT), the proposed KKTV facility will employ the same technical parameters as allotted in MB Docket 09-111. Since no extension in contour location beyond that of the allotment will result, interference analysis to other television facilities is not required. A 100.0 percent match of the allotted service population is provided, as detailed in the following table.

Post-Transition Population Summary		
Population Summary (2000 Census) OET Bulletin 69 method	MB Docket 09-111 550 kW 725 m	Proposed 550 kW 724 m
Within Noise Limited Contour	2,418,194	2,418,194
Not affected by terrain losses	1,922,413	1,922,413
Lost to all interference	0	0
Net DTV Service	1,922,413	1,922,413
Match of Allotment	---	100.00%

The proposed 550 kW ERP exceeds the maximum allowed for the proposed antenna HAAT of 724 meters currently permitted by §73.622(f)(8)(i). Section 73.622(f)(5) permits the maximum ERP to be exceeded in order to provide the same geographic coverage area as the largest station within the same market. The total area within the proposed KKTV 41 dBμ contour is 40,174 square kilometers, which does not exceed the 40,257 square kilometers within the authorized KTSC(DT) facility (Ch. 8, Pueblo, CA, BMPEDT-20090223ABD as covered by pending BLEDT-20090612AAM). A coverage contour comparison map is provided as **Figure 4**. Thus, the ERP specified herein is in compliance with §73.622(f)(5) of the Commission's Rules.

The nearest FCC monitoring station is 601 km distant at Grand Island, NE. 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 AM stations within

3.2 kilometers of the site, based on information contained within the Commission's database. The site location is beyond the border areas requiring international coordination.

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

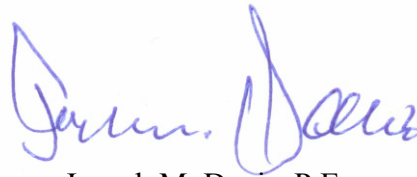
The proposal will involve use of a replacement top-mounted transmitting antenna, with no extension of existing overall structure height. The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's 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 8 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 $16.7 \mu\text{W}/\text{cm}^2$, which is 3.7 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.

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.
September 10, 2009

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

List of Attachments

Figure 1, 1A Antenna Horizontal Plane Pattern
Figure 2, 2A Antenna Vertical Plane (Elevation) Pattern
Figure 3 Proposed Coverage Contours
Figure 4 Maximum ERP per §73.622(f)
Form 301 Saved Version of Engineering Sections from FCC Form at Time of Upload

This material was entered September 10, 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.

AZIMUTH PATTERN**TYPE:****CH49HAZ-C170****Numeric****dB****Directivity:****1.70****2.30****Peak(s) at:****Polarization:****Horizontal****Frequency:****49 (Digital)****Location:****Colorado Springs, CO**

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

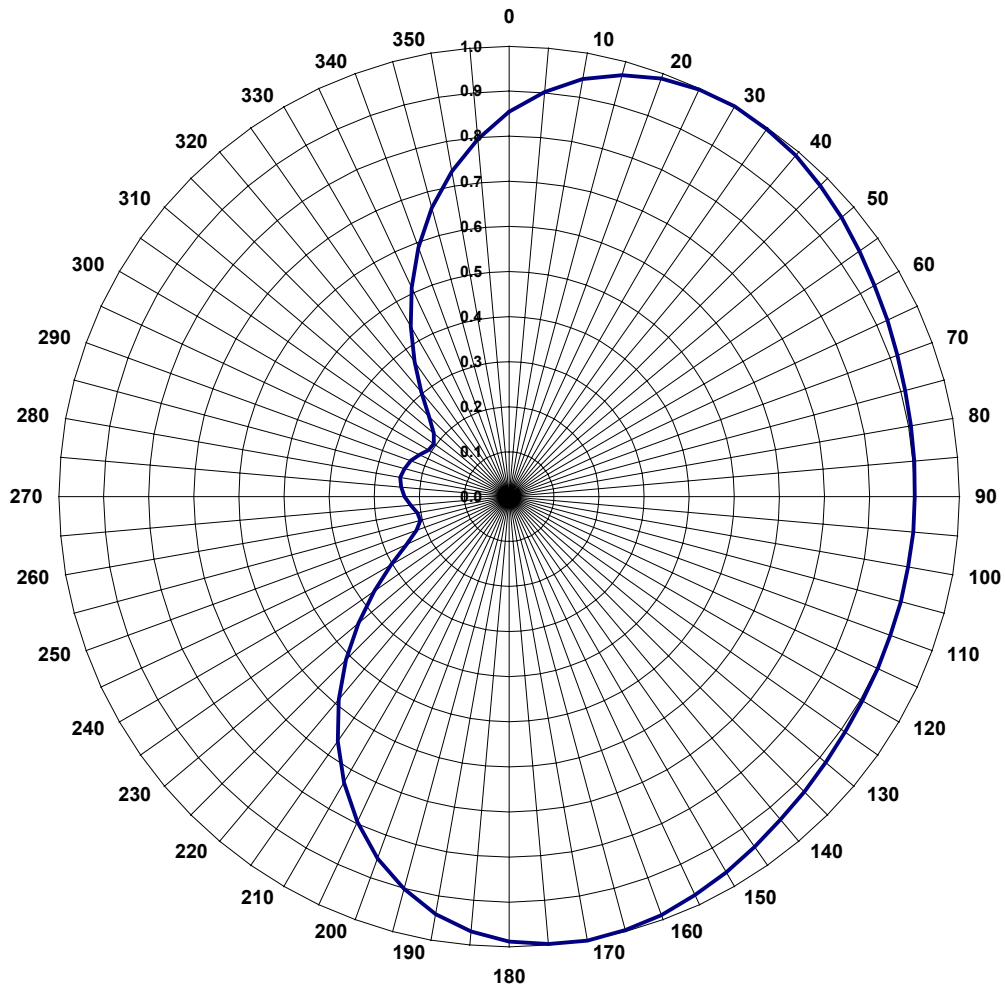
**ELECTRONICS RESEARCH, INC. ERI®**

Figure 1
Antenn Horizontal Plane Pattern
Horizontal Polarization
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 49 550 kW 724 m

prepared for
Gray Television Licensee, LLC

September, 2009

AZIMUTH PATTERN**TYPE:****CH49VAZ-V20**

Numeric	dB
2.00	3.01

Directivity:**Peak(s) at:****Polarization:****Vertical****Frequency:****49 (Digital)****Location:****Colorado Springs, CO**

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

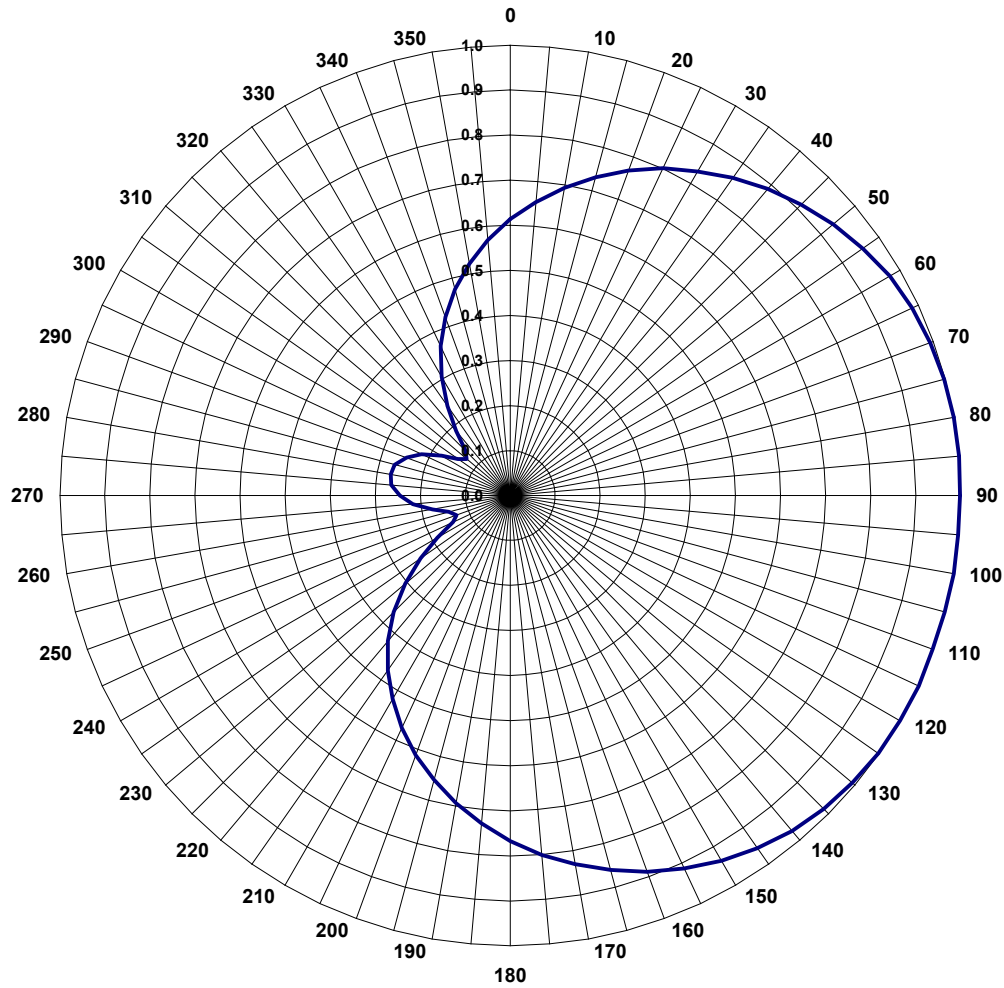
**ELECTRONICS RESEARCH, INC. ERI®**

Figure 1A
Antenn Horizontal Plane Pattern
Vertical Polarization
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 49 550 kW 724 m

prepared for
Gray Television Licensee, LLC

September, 2009

ELEVATION PATTERN

TYPE:	ATW22HS5H	
Directivity:	Numeric	dBd
Main Lobe:	22.00	13.42
Horizontal:	7.63	8.83

Frequency:	49 (Digital)
Location:	Colorado Springs, CO
Beam Tilt:	1.25
Polarization:	Horizontal

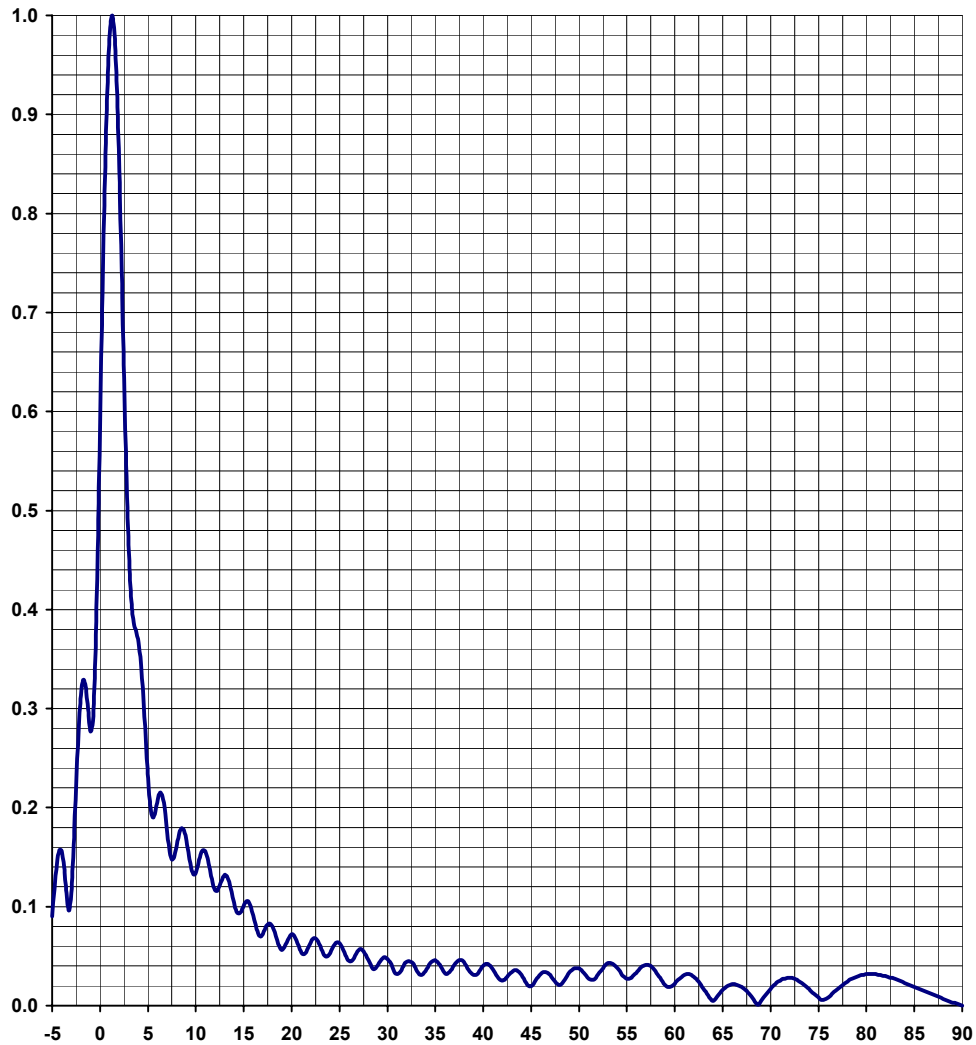
**ELECTRONICS RESEARCH, INC. ERI**

Figure 2
Antenna Vertical (Elevation)
Plane Pattern
Facility ID 35037
Ch. 49 550 kW 724 m

prepared for
Gray Television Licensee, LLC

September, 2009

ELEVATION PATTERN

TYPE:	ATW22HS5H	
Directivity:	Numeric	dBd
Main Lobe:	22.00	13.42
Horizontal:	7.63	8.83

Frequency:	49 (Digital)
Location:	Colorado Springs, CO
Beam Tilt:	1.25
Polarization:	Horizontal

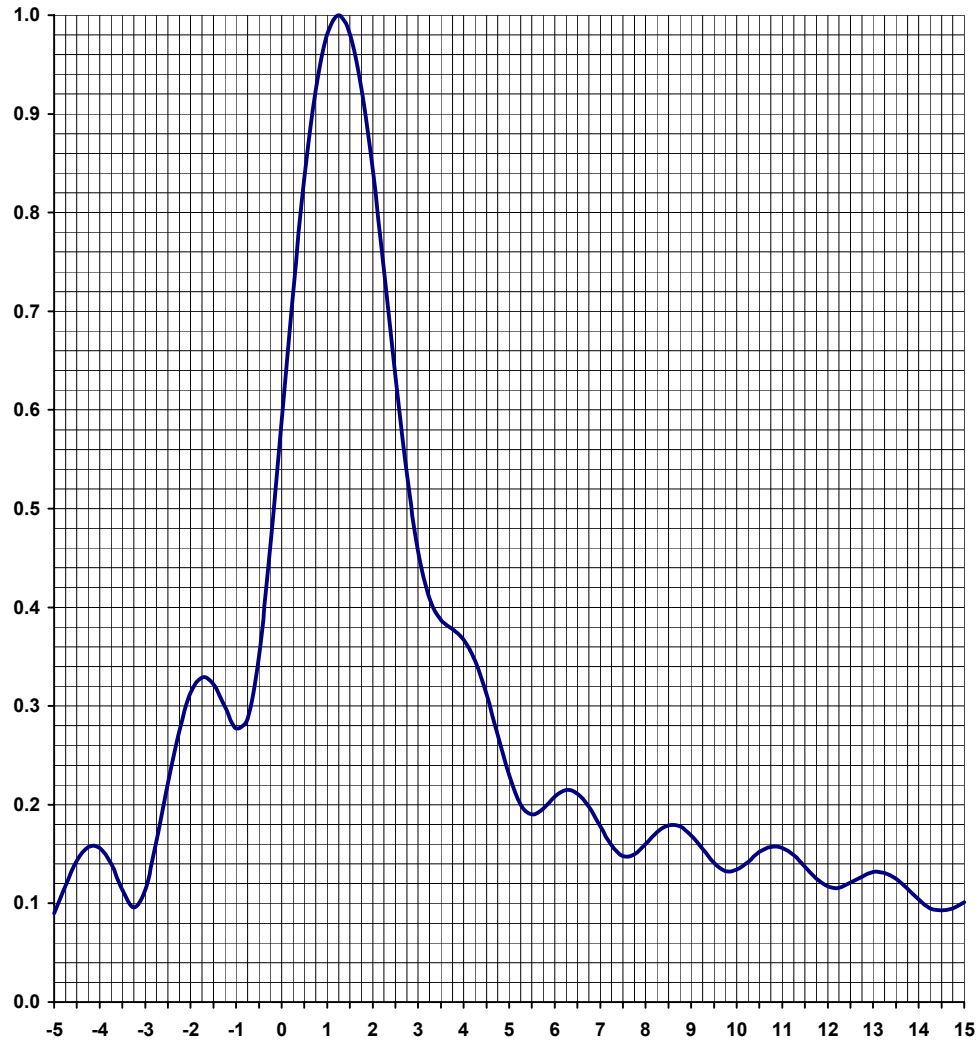
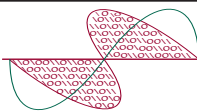
**ELECTRONICS RESEARCH, INC. ERI**

Figure 2A
Antenna Vertical (Elevation)
Plane Pattern - Detail
Facility ID 35037
Ch. 49 550 kW 724 m

prepared for
Gray Television Licensee, LLC

September, 2009

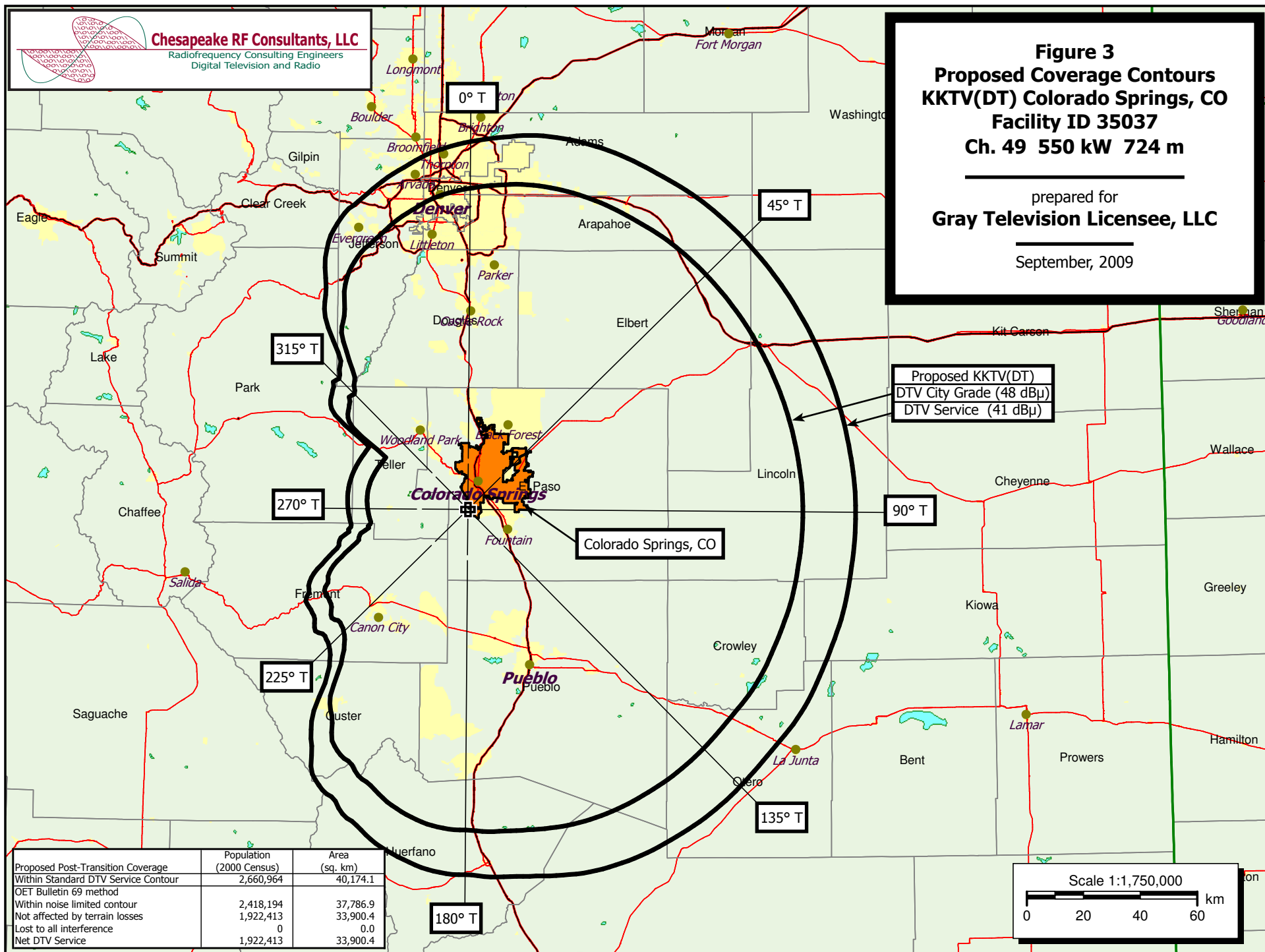


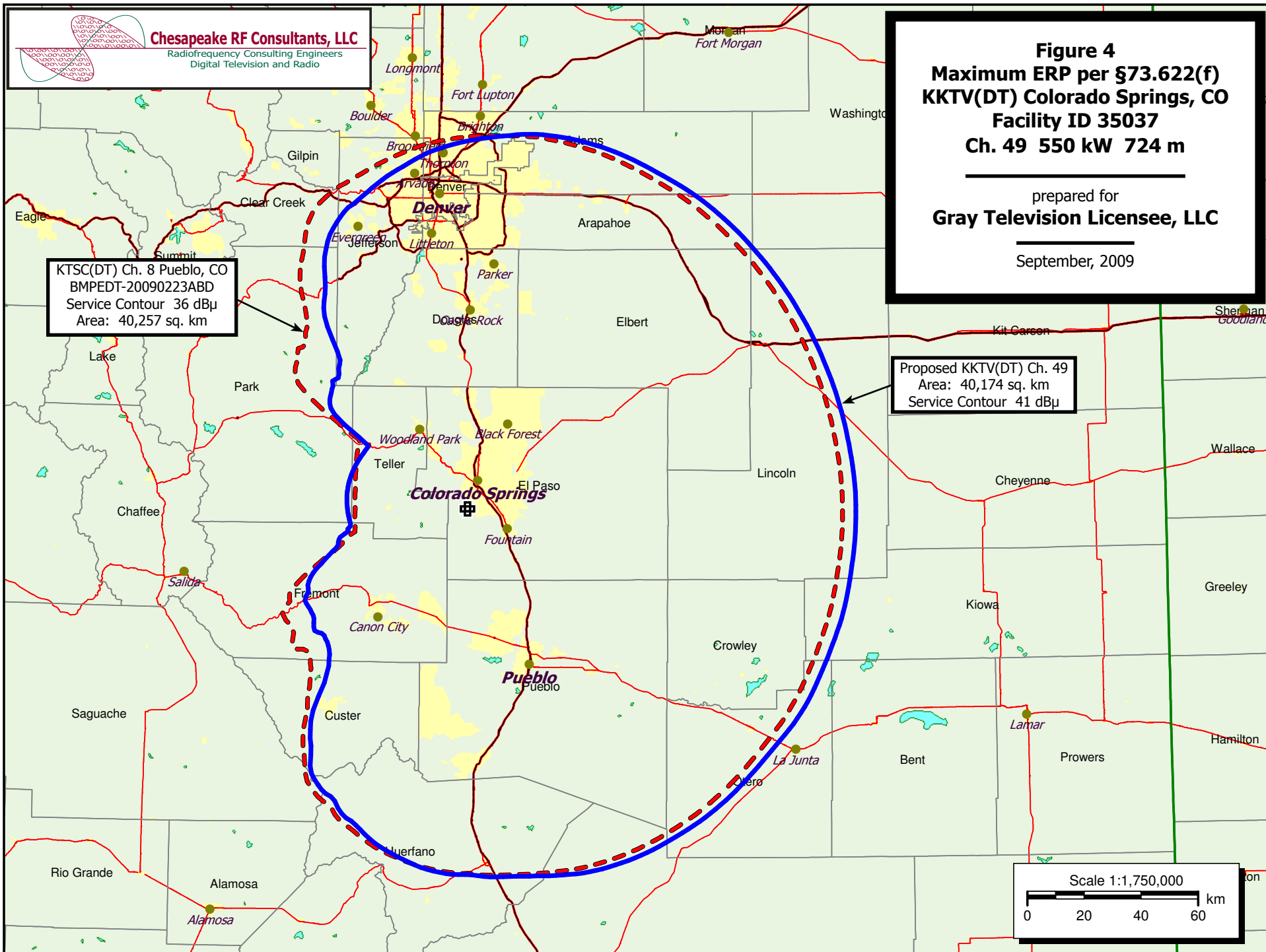
Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 3
Proposed Coverage Contours
KKTV(DT) Colorado Springs, CO
Facility ID 35037
Ch. 49 550 kW 724 m

prepared for
Gray Television Licensee, LLC

September, 2009





SECTION III-D - DTV Engineering	
Complete Questions 1-5, and provide all data and information for the proposed facility, as requested in Technical Specifications, Items 1-13.	
<p>Pre-Transition Certification Checklist: An application concerning a pre-transition channel must complete questions 1(a)-(c), and 2-5. A correct answer of "Yes" to all of the questions will ensure an expeditious grant of a construction permit application to change pre-transition facilities. However, if the proposed facility is located within the Canadian or Mexican borders, coordination of the proposal under the appropriate treaties may be required prior to grant of the application. An answer of "No" will require additional evaluation of the applicable information in this form before a construction permit can be granted.</p> <p>Post-Transition Expedited Processing. An application concerning a post-transition channel must complete questions 1(a), (d)-(e), and 2-5. A station applying for a construction permit to build its post-transition channel will receive expedited processing if its application (1) does not seek to expand the noise-limited service contour in any direction beyond that established by Appendix B of the Seventh Report and Order in MB Docket No. 87-268 establishing the new DTV Table of Allotments in 47 C.F.R. § 73.622(i) ("new DTV Table Appendix B"); (2) specifies facilities that match or closely approximate those defined in the new DTV Table Appendix B facilities; and (3) is filed within 45 days of the effective date of Section 73.616 of the rules adopted in the Report and Order in the Third DTV Periodic Review proceeding, MB Docket No. 07-91.</p>	
1. The proposed DTV facility complies with 47 C.F.R. Section 73.622 in the following respects:	
(a) It will operate on the DTV channel for this station as established in 47 C.F.R. Section 73.622.	<input checked="" type="radio"/> Yes <input type="radio"/> No
(b) It will operate a pre-transition facility from a transmitting antenna located within 5.0 km (3.1 miles) of the DTV reference site for this station as established in 47 C.F.R. Section 73.622.	<input type="radio"/> Yes <input type="radio"/> No
(c) It will operate a pre-transition facility with an effective radiated power (ERP) and antenna height above average terrain (HAAT) that do not exceed the DTV reference ERP and HAAT for this station as established in 47 C.F.R. Section 73.622.	<input type="radio"/> Yes <input type="radio"/> No
(d) It will operate at post-transition facilities that do not expand the noise-limited service contour in any direction beyond that established by Appendix B of the Seventh Report and Order in MB Docket No. 87-268 establishing the new DTV Table of Allotments in 47 C.F.R. § 73.622(i) ("new DTV Table Appendix B").	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
(e) It will operate at post-transition facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the new DTV Table Appendix B.	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
2. The proposed facility will not have a significant environmental impact, including exposure of workers or the general public to levels of RF radiation exceeding the applicable health and safety guidelines, and therefore will not come within 47 C.F.R. Section 1.1307. Applicant must submit the Exhibit called for in Item 13.	<input checked="" type="radio"/> Yes <input type="radio"/> No
3. Pursuant to 47 C.F.R. Section 73.625, the DTV coverage contour of the proposed facility will encompass the allotted principal community.	<input checked="" type="radio"/> Yes <input type="radio"/> No
4. The requirements of 47 C.F.R. Section 73.1030 regarding notification to radio astronomy installations, radio receiving installations and FCC monitoring stations have either been satisfied or are not applicable.	<input checked="" type="radio"/> Yes <input type="radio"/> No
5. The antenna structure to be used by this facility has been registered by the Commission and will not require registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely effect safety in air navigation and this structure qualifies for later registration under the Commission's phased registration plan, OR the proposed installation on this structure does not require notification to the FAA pursuant to 47 C.F.R. Section 17.7.	<input checked="" type="radio"/> Yes <input type="radio"/> No

SECTION III-D - DTV Engineering	
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: DTV 49 Analog TV, if any
2.	Zone: <input type="radio"/> I <input checked="" type="radio"/> II <input type="radio"/> III
3.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 38 Minutes 44 Seconds 42 <input checked="" type="radio"/> North <input type="radio"/> South Longitude: Degrees 104 Minutes 51 Seconds 43 <input checked="" type="radio"/> West <input type="radio"/> East
4.	Antenna Structure Registration Number: 1024861 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA
5.	Antenna Location Site Elevation Above Mean Sea Level: 2877 meters
6.	Overall Tower Height Above Ground Level: 107.6 meters
7.	Height of Radiation Center Above Ground Level: 97.7 meters
8.	Height of Radiation Center Above Average Terrain : 723.8 meters
9.	Maximum Effective Radiated Power (average power): 550 kW

10.	<p>Antenna Specifications:</p> <p>a. Manufacturer ERI Model ATW22HS5-ETC170-49H</p> <p>b. Electrical Beam Tilt: 1.25 degrees <input type="checkbox"/> Not Applicable</p> <p>c. Mechanical Beam Tilt: degrees toward azimuth degrees True <input checked="" type="checkbox"/> Not Applicable</p> <p>Attach as an Exhibit all data specified in 47 C.F.R. Section 73.625(c). [Exhibit 43]</p> <p>d. Polarization: <input type="radio"/> Horizontal <input type="radio"/> Circular <input checked="" type="radio"/> Elliptical</p> <p>e. Directional Antenna Relative Field Values: <input type="checkbox"/> Not applicable (Nondirectional)</p> <p>[For a composite directional (not off-the-shelf) antenna, press the following button to fill in the relative field values subform.] [Relative Field Values]</p> <div style="text-align: center;">10e. Directional Antenna Relative Field Values [Fill in this subform for a composite directional (not off-the-shelf) antenna, only.]</div> <table border="1"><tr><td colspan="12">e. Directional Antenna Relative Field Values:</td></tr><tr><td colspan="12">Rotation (Degrees): <input checked="" type="checkbox"/> No Rotation</td></tr><tr><td>Degrees</td><td>Value</td><td>Degrees</td><td>Value</td><td>Degrees</td><td>Value</td><td>Degrees</td><td>Value</td><td>Degrees</td><td>Value</td><td>Degrees</td><td>Value</td></tr><tr><td>0</td><td>0.854</td><td>10</td><td>0.94</td><td>20</td><td>0.987</td><td>30</td><td>1</td><td>40</td><td>0.988</td><td>50</td><td>0.963</td></tr><tr><td>60</td><td>0.936</td><td>70</td><td>0.917</td><td>80</td><td>0.905</td><td>90</td><td>0.9</td><td>100</td><td>0.899</td><td>110</td><td>0.9</td></tr><tr><td>120</td><td>0.905</td><td>130</td><td>0.917</td><td>140</td><td>0.936</td><td>150</td><td>0.963</td><td>160</td><td>0.988</td><td>170</td><td>1</td></tr><tr><td>180</td><td>0.987</td><td>190</td><td>0.94</td><td>200</td><td>0.854</td><td>210</td><td>0.733</td><td>220</td><td>0.588</td><td>230</td><td>0.437</td></tr><tr><td>240</td><td>0.302</td><td>250</td><td>0.218</td><td>260</td><td>0.207</td><td>270</td><td>0.232</td><td>280</td><td>0.245</td><td>290</td><td>0.232</td></tr><tr><td>300</td><td>0.207</td><td>310</td><td>0.218</td><td>320</td><td>0.302</td><td>330</td><td>0.437</td><td>340</td><td>0.588</td><td>350</td><td>0.733</td></tr><tr><td colspan="2">Additional Azimuths</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p style="text-align: center;">Relative Field Polar Plot</p>	e. Directional Antenna Relative Field Values:												Rotation (Degrees): <input checked="" type="checkbox"/> No Rotation												Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	0	0.854	10	0.94	20	0.987	30	1	40	0.988	50	0.963	60	0.936	70	0.917	80	0.905	90	0.9	100	0.899	110	0.9	120	0.905	130	0.917	140	0.936	150	0.963	160	0.988	170	1	180	0.987	190	0.94	200	0.854	210	0.733	220	0.588	230	0.437	240	0.302	250	0.218	260	0.207	270	0.232	280	0.245	290	0.232	300	0.207	310	0.218	320	0.302	330	0.437	340	0.588	350	0.733	Additional Azimuths											
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	<p>If a directional antenna is proposed, the requirements of 47 C.F.R. Sections 73.625(c) must be satisfied. Exhibit required. [Exhibit 44]</p>																																																																																																																								
11.	<p>Does the proposed facility satisfy the pre-transition interference protection provisions of 47 C.F.R. Section 73.623(a) (Applicable only if Certification Checklist Items 1(a), (b), or (c) are answered "No.") and/or the post-transition interference protection provisions of 47 C.F.R. Section 73.616? <input checked="" type="radio"/> Yes <input type="radio"/> No [Exhibit 45]</p> <p>If "No," attach as an Exhibit justification therefor, including a summary of any related previously granted waivers.</p>																																																																																																																								
12.	<p>If the proposed facility will not satisfy the coverage requirement of 47 C.F.R. Section 73.625, attach as an Exhibit justification therefore. (Applicable only if Certification Checklist item 3 is answered "No.") [Exhibit 46]</p>																																																																																																																								
13.	<p>Environmental Protection Act. Submit in an Exhibit the following: [Exhibit 47]</p> <p>If Certification Checklist Item 2 is answered "Yes," a brief explanation of why an Environmental Assessment is not required. Also describe in the Exhibit the steps that will be taken to limit RF radiation exposure to the public and to persons authorized access to the tower site.</p> <p>By checking "Yes" to Certification Checklist Item 2, 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.</p> <p>If Certification Checklist Item 2 is answered "No," an Environmental Assessment as required by 47 C.F.R Section 1.1311.</p>																																																																																																																								
<p>PREPARERS CERTIFICATION ON SECTION III MUST BE COMPLETED AND SIGNED.</p>																																																																																																																									

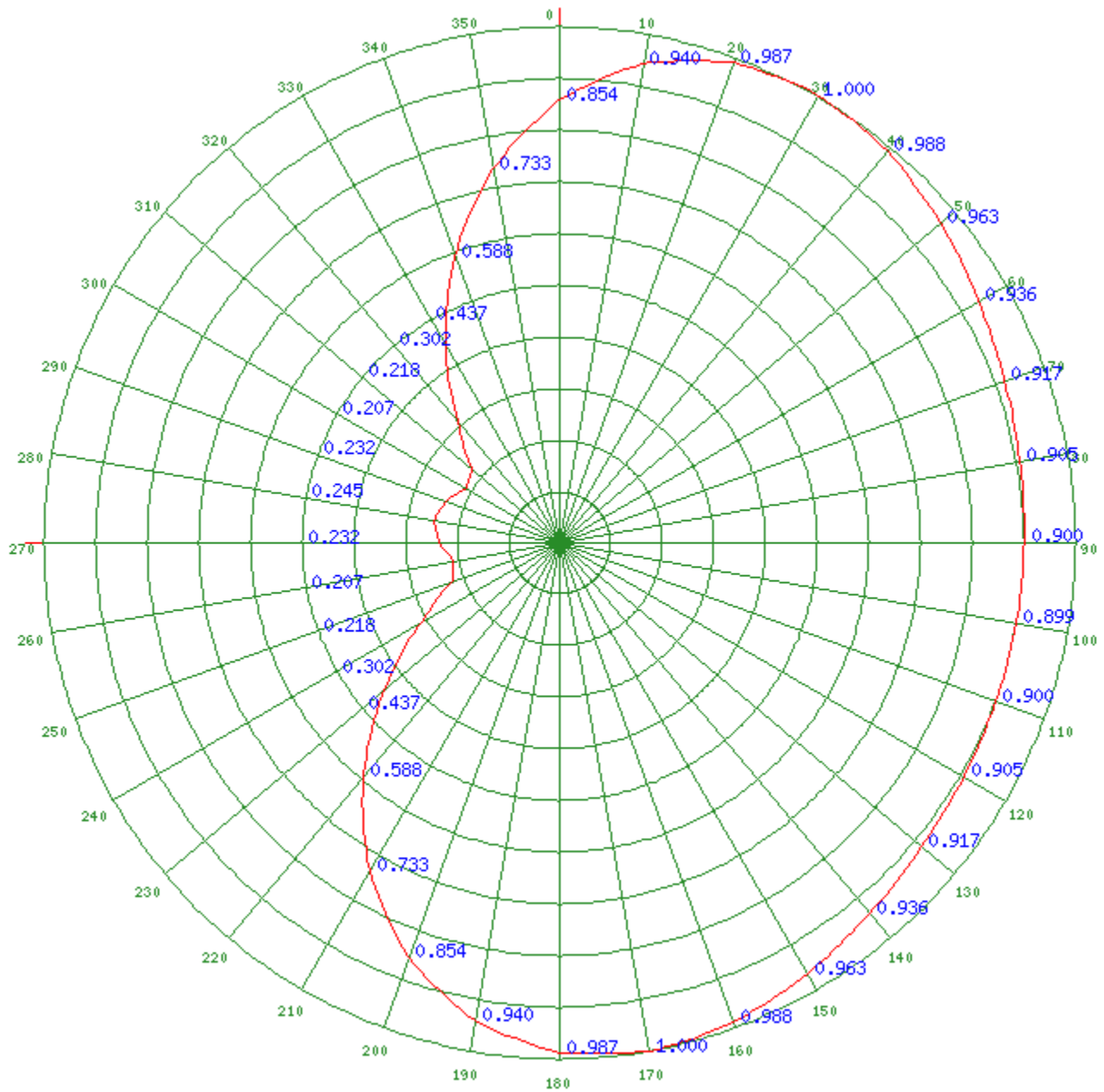
SECTION III - PREPARER'S CERTIFICATION

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 9/10/2009	
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	

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.

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