

## **ENGINEERING EXHIBIT**

### **Application for Digital Low Power Television Station Modification of Construction Permit**

prepared for

#### **Ramar Communications, Inc.**

K47MQ-D Santa Fe, NM

Facility ID 183557

Ch. 47 (digital) 2.11 kW

*Ramar Communications, Inc.* (“*Ramar*”) is the permittee of unbuilt Low Power Television station K47MQ-D, digital Channel 47, Santa Fe NM, Facility ID 183557. A Construction Permit (“CP” BNPDTL-20091014AAX) authorizes operation with 5 kW effective radiated power (“ERP”).

*Ramar* herein proposes herein to modify the CP to specify decreased ERP and antenna height at the currently authorized site.

The proposed facility will employ a new antenna system to be side-mounted on an existing tower structure associated with Antenna Structure Registration (“ASR”) number 1056007. A change in geographic coordinates of two seconds longitude is specified herein to correspond to the ASR’s coordinates. No change to the overall structure height is proposed. The site is located more than 121 kilometers (75 miles) from the reference coordinates of the cities listed in Appendix A of DA 09-1487.<sup>1</sup>

The proposed facility will operate on the currently authorized Channel 47 as digital at 2.11 kW ERP using a “stringent” out of channel emission mask. Figure 1 depicts the coverage contour of the proposed facility as well as that of the authorized K47MQ-D facility. The use of the same site and the corresponding service area overlap demonstrate compliance with §74.787(b) for a minor change.

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<sup>1</sup>“Commencement of Rural, First-come, First-served digital licensing for Low Power Television and TV Translators Beginning August 25, 2009 and Commencement of Nationwide, First-come, First-served Digital Licensing for Low Power Television and TV Translator Services Beginning January 25, 2010,” Public Notice, DA 09-1487, Released June 29, 2009.

Interference study per OET Bulletin 69<sup>2</sup> shows that the proposal complies with the FCC's interference protection requirements toward all 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) to any facility. Accordingly, the proposal complies with §74.793 regarding interference protection to digital television, low power television, television translator, and Class A television facilities.

The nearest FCC monitoring station is 610 km distant at Douglas, AZ. 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). The site is not within a border area requiring international coordination. No authorized AM stations are located within 3 km of the site.

### **Human Exposure to Radiofrequency Electromagnetic Field**

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 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  $3.3 \mu\text{W}/\text{cm}^2$ , which is 0.7 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

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<sup>2</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.

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. The proposed transmitting antenna will be side-mounted on an existing antenna support that was constructed prior to March 16, 2001 and will not result in any change in overall structure height.

### **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.



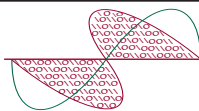
Joseph M. Davis, P.E.  
April 14, 2014

**Chesapeake RF Consultants, LLC**  
207 Old Dominion Road  
Yorktown, VA 23692  
703-650-9600

### List of Attachments

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

*This material was entered April 14, 2014 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's account number 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.*



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

**Figure 1**  
**Coverage Contour Comparison**  
**K47MQ-D Santa Fe, NM**  
**Facility ID 183557**  
**Ch. 47 (digital) 2.11 kW**

prepared for  
**Ramar Communications, Inc.**

April, 2014

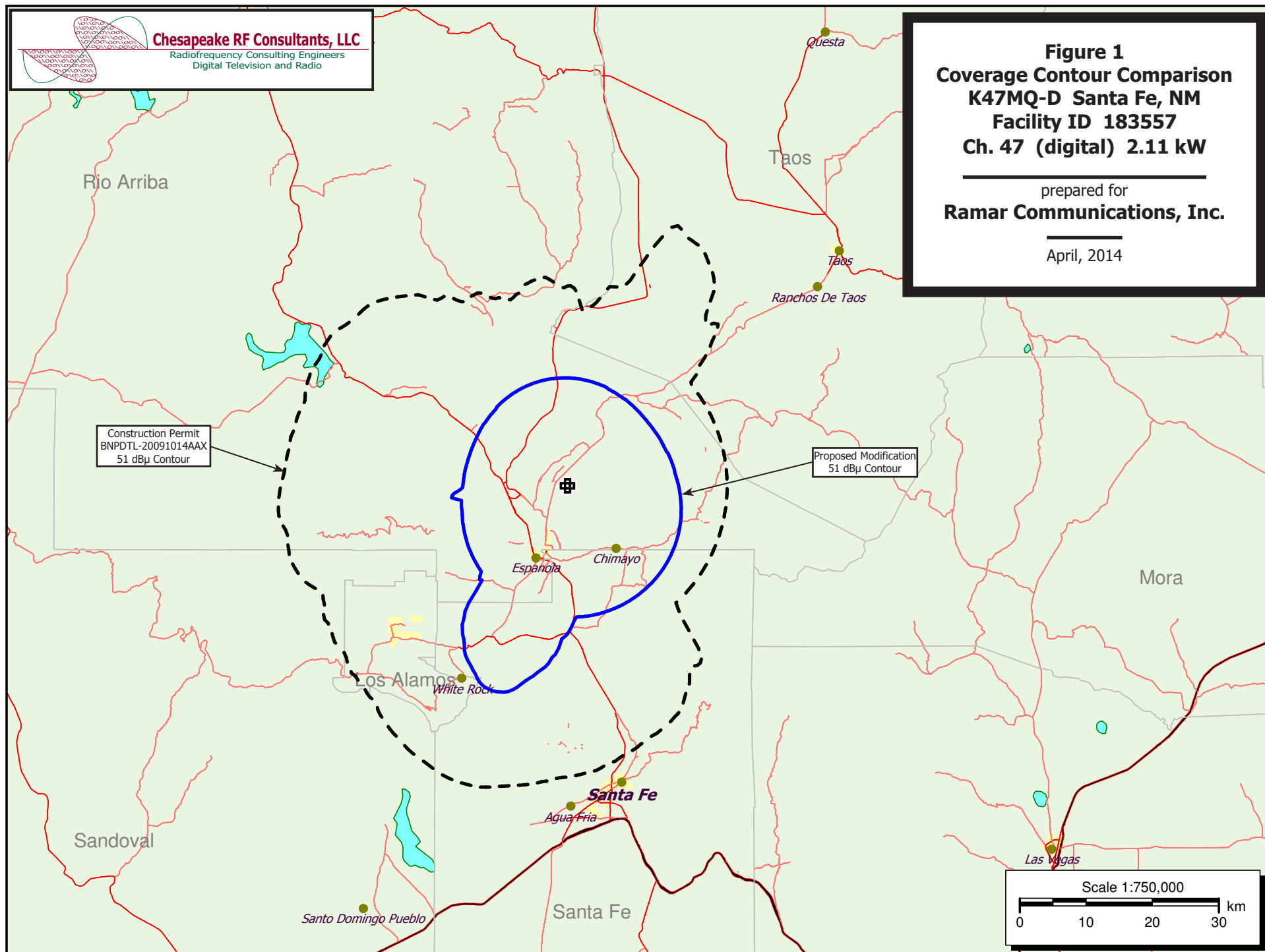
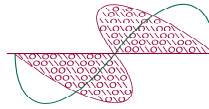


Table 1

**Interference Analysis Results Summary**

prepared for

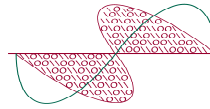
**Ramar Communications, Inc.****K47MQ-D Santa Fe, NM****Chesapeake RF Consultants, LLC**Radiofrequency Consulting Engineers  
Digital Television and Radio

K47MQ-D	USERRECORD-01	SANTA FE	NM US
Channel 47	ERP 2.11 kW	HAAT 32. m	RCAMSL 01832 m
STRINGENT MASK			
Latitude 036-05-21	Longitude 0106-01-41		
Dir Antenna Make	usr Model AND_OC	Beam tilt N	Ref Azimuth 170.

Ch.	Call	City/State	Dist	Status	Application Ref. No.	---Population (2000 Census)----	
			(km)			Baseline	New Interference
33	K33BN	TAOS NM	55.4	LIC	BLTT-20050912AAD	---	none
40	K40HC	CHAMA NM	103.6	LIC	BLTT-20060109ABT	---	none
43	K43IA	TAOS NM	55.4	LIC	BLTT-20060420ACX	---	none
44	K44DD	CHAMA NM	103.6	LIC	BLTT-19920702IC	---	none
46	K46JN-D	AGUILAR CO	190.1	LIC	BLDTT-20101006AAY	---	none
46	K46FM-D	BAYFIELD CO	177.8	LIC	BLDTT-20111020AGQ	---	none
46	K46JO-D	DEL NORTE CO	177.3	LIC	BLDTT-20101006AAZ	---	none
46	K46BY-D	CAPULIN, ETC. NM	204.2	LIC	BLDTT-20120608ABW	---	none
46	K46FI	GRANTS NM	169.4	LIC	BLTT-20010814AAD	---	none
46	K46FI	GRANTS NM	169.4	CP	BDFCDTT-20081222AAR	---	none
46	K46GL-D	RED RIVER NM	88.3	LIC	BLDTT-20120308ABA	---	none
46	K46GY	SANTA FE NM	104.5	LIC	BLTT-20030403AAN	---	none
47	NEW	ASPEN CO	355.8	APP	BNPDTL-20090825BXO	---	none
47	K50IV-D	CORTEZ CO	240.9	APP	BPTT-20040805AAJ	---	none
47	K47BL-D	CRESTED BUTTE CO	312.3	LIC	BLDTT-20100301AAJ	---	none
47	KSBS-LP	DENVER CO	403.9	CP	BPTTA-20120726AAA	---	none
47	KSBS-LP	DENVER CO	376.3	LIC	BLTTA-20040524ALT	---	none
47	DK47CJ	DEORA CO	323.0	LIC	BLTT-19880621IQ	---	none
47	K47JR	GRAND JUNCTION CO	382.2	CP	BDFCDTT-20140220ACE	---	none
47	K47FJ	MANITOU SPRINGS CO	323.7	LIC	BLTT-19980318JN	---	none
47	K47KC-D	ROMEO CO	85.6	LIC	BLDTL-20130926AYO	---	none
47	K47LZ-D	SARGENTS CO	268.9	LIC	BLDTT-20091021ABL	---	none
47	K47AC	SILT, ETC. CO	389.9	LIC	BLTT-19800513IB	---	none
47	KOAA-TV	WOODLAND PARK CO	333.0	LIC	BLCDT-20140210AAT	---	none
47	KTEL-LP	ALBUQUERQUE NM	104.5	LIC	BLTTL-20071025AAD	---	none
47	KTEL-LP	ALBUQUERQUE NM	104.4	CP	BDFCDTA-20130918AER	---	none
47	K47DH	CLOVIS NM	314.6	LIC	BLTT-19910712JL	---	none
47	K47DR	FARMINGTON NM	203.9	CP	BDFCDTL-20110223ACC	---	none
47	K47DR	FARMINGTON NM	203.9	LIC	BLTTL-19951211JA	---	none
47	K47GV-D	LAS VEGAS NM	87.7	LIC	BLDTT-20110727AGG	---	none
47	KGDR-LP	RUIDOSO NM	299.3	LIC	BLTT-19950502IF	---	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>(km)</u>	<u>Status</u>	<u>Application Ref. No.</u>	<u>---Population (2000 Census)---</u>	
						<u>Baseline</u>	<u>New Interference</u>
47	K46GY	SANTA FE NM	104.5	CP	BDISDTL-20100308AAZ	---	none
47	K47MS-D	AMARILLO TX	390.8	CP	BNPDTL-20091218AFH	---	none
47	K47JI-D	BLANDING, MONTICELLO UT	361.7	LIC	BLDTT-20090914ABC	---	none
48	K48HA	PAGOSA SPRINGS CO	155.1	LIC	BLTT-20040325ACK	---	none
48	K48HA	PAGOSA SPRINGS CO	155.1	CP	BDFCDTT-20081219AAF	---	none
48	KTFA-LP	ALBUQUERQUE NM	104.7	LIC	BLTTL-20031212ABM	---	none
48	KTFA-LP	ALBUQUERQUE NM	104.7	CP	BDFCDTL-20120410ABQ	---	none
48	K48JH-D	CAPULIN, ETC. NM	204.2	LIC	BLDTT-20120608ABY	---	none
48	K48AX-D	EAGLE NEST NM	94.2	LIC	BLDTT-20120608ACT	---	none
48	DK48GD	GALLINA NM	67.4	CP	BDFCDTT-20090824AIS	---	none
51	K51DM	ANTONITO NM	85.7	LIC	BLTT-19911220JK	---	none

Section III - Engineering (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: 47																																																																																																										
2.	Translator Input Channel No. :																																																																																																										
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></table>											Facility Identifier	Call Sign	City	State	Channel																																																																																											
Facility Identifier	Call Sign	City	State	Channel																																																																																																							
4.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 36 Minutes 5 Seconds 21 <input checked="" type="radio"/> North <input type="radio"/> South  Longitude: Degrees 106 Minutes 1 Seconds 41 <input checked="" type="radio"/> West <input type="radio"/> East																																																																																																										
5.	Antenna Structure Registration Number: 1056007 <input type="checkbox"/> Not Applicable [Exhibit 11] <input type="checkbox"/> Notification filed with FAA																																																																																																										
6.	Antenna Location Site Elevation Above Mean Sea Level: 1786 meters																																																																																																										
7.	Overall Tower Height Above Ground Level: 370 meters																																																																																																										
8.	Height of Radiation Center Above Ground Level: 46 meters																																																																																																										
9.	Maximum Effective Radiated Power (ERP): 2.11 kW																																																																																																										
10.	Transmitter Output Power: 0.2 kW																																																																																																										
11.	<p>a. Transmitting Antenna: Before selecting Directional "Off-the-Shelf", refer to "Search for Antenna Information" under <a href="http://licensing.fcc.gov/prod/cdbforms/pubacc/prod/cdb_pa.htm">CDBS Public Access</a> (http://licensing.fcc.gov/prod/cdbforms/pubacc/prod/cdb_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 checked="" type="radio"/> Directional Off-the Shelf <input type="radio"/> Directional composite</p> <p>Manufacturer AND Model ALP80C</p> <p>b. Electrical Beam Tilt: 0.25 degrees <input type="checkbox"/> Not Applicable</p> <p>c. Mechanical Beam Tilt: degrees toward azimuth degrees True <input type="checkbox"/> Not Applicable</p> <p>d. Directional Antenna Relative Field Values: <input checked="" type="checkbox"/> N/A (Nondirectional or Off-the-Shelf) Rotation (Degrees): 170 <input type="checkbox"/> No Rotation</p> <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></td><td>10</td><td></td><td>20</td><td></td><td>30</td><td></td><td>40</td><td></td><td>50</td><td></td></tr><tr><td>60</td><td></td><td>70</td><td></td><td>80</td><td></td><td>90</td><td></td><td>100</td><td></td><td>110</td><td></td></tr><tr><td>120</td><td></td><td>130</td><td></td><td>140</td><td></td><td>150</td><td></td><td>160</td><td></td><td>170</td><td></td></tr><tr><td>180</td><td></td><td>190</td><td></td><td>200</td><td></td><td>210</td><td></td><td>220</td><td></td><td>230</td><td></td></tr><tr><td>240</td><td></td><td>250</td><td></td><td>260</td><td></td><td>270</td><td></td><td>280</td><td></td><td>290</td><td></td></tr><tr><td>300</td><td></td><td>310</td><td></td><td>320</td><td></td><td>330</td><td></td><td>340</td><td></td><td>350</td><td></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></tbody></table> <p>e. Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt? <input type="radio"/> Yes <input checked="" type="radio"/> No [Exhibit 12]</p> <p>If Yes, attach an Exhibit (see instructions for details).</p>											Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	0		10		20		30		40		50		60		70		80		90		100		110		120		130		140		150		160		170		180		190		200		210		220		230		240		250		260		270		280		290		300		310		320		330		340		350		Additional Azimuths											
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Additional Azimuths																																																																																																											
<a href="#">Relative Field Polar Plot</a>																																																																																																											
<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.	Out-of-channel Emission Mask: <input type="radio"/> Simple <input checked="" type="radio"/> Stringent <input type="radio"/> Full Service																																																																																																										
CERTIFICATION																																																																																																											
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. <input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 13]																																																																																																										

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> .	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 14]
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.

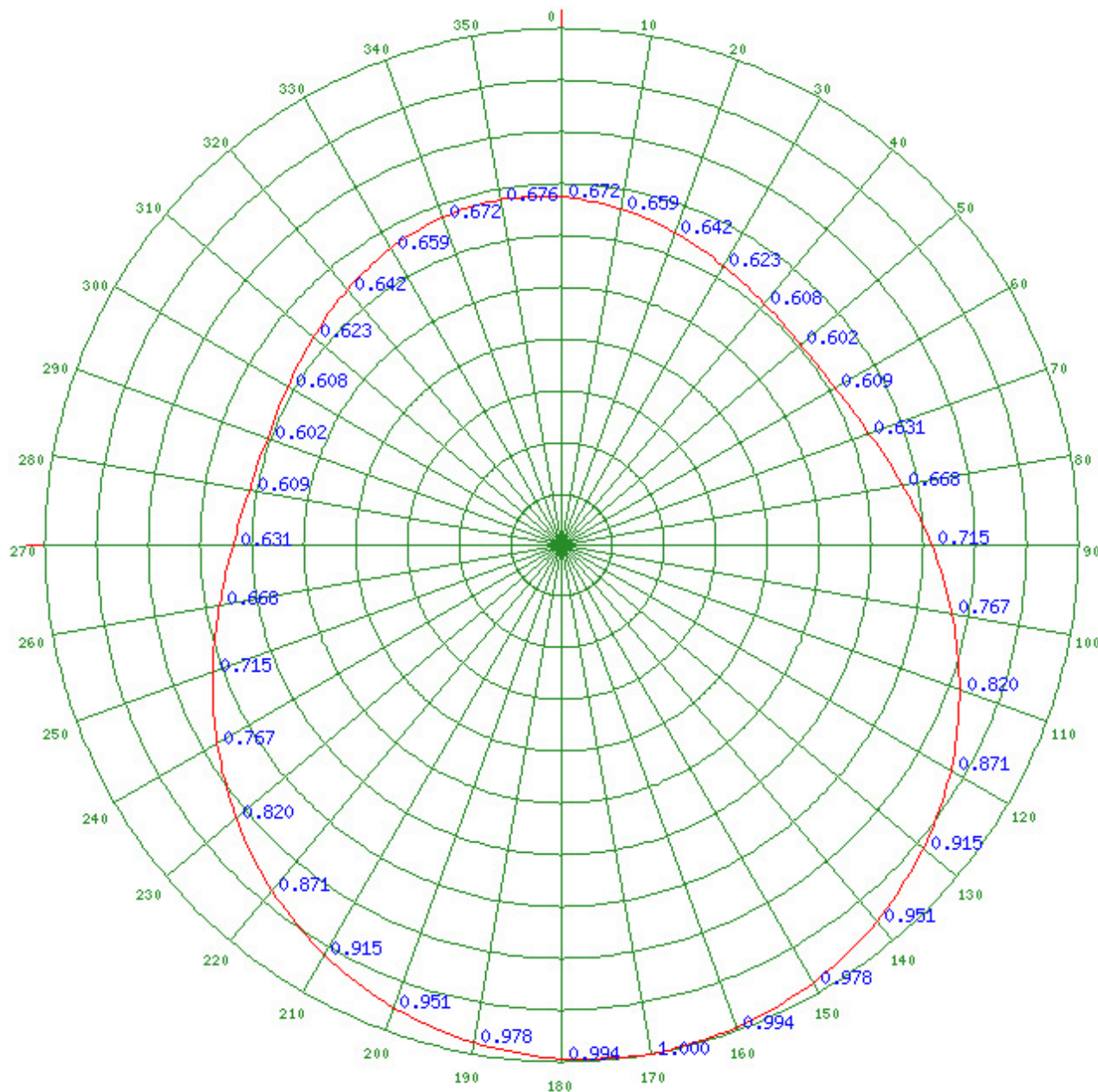
Name JOSEPH M. DAVIS, P.E.	Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature	Date 04/14/2014	
Mailing Address CHESAPEAKE RF CONSULTANTS LLC 207 OLD DOMINION ROAD		
City YORKTOWN	State or Country (if foreign address) VA	Zip Code 23692 -
Telephone Number (include area 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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