

ENGINEERING STATEMENT RE  
APPLICATION FOR  
MODIFICATION OF CONSTRUCTION PERMIT  
FCC FILE NO. BNPDTT-20090825BVS  
TO CHANGE TRANSMITTER SITE  
K18IZ-D, GRANDFIELD, OKLAHOMA  
CHANNEL 18 15 KW MAX DA ERP 653.1 METERS RC/AMSL

JULY 2010

COHEN, DIPPELL AND EVERIST, P.C.  
CONSULTING ENGINEERS  
RADIO AND TELEVISION  
WASHINGTON, D.C.

COHEN, DIPPELL AND EVERIST, P. C.

City of Washington            )  
  ) ss  
District of Columbia         )


Donald G. Everist, being duly sworn upon his oath, deposes and states that:

He is a graduate electrical engineer, a Registered Professional Engineer in the District of Columbia, and is President, Secretary and Treasurer of Cohen, Dippell and Everist, P.C., Consulting Engineers, Radio - Television, with offices at 1300 L Street, N.W., Suite 1100, Washington, D.C. 20005;

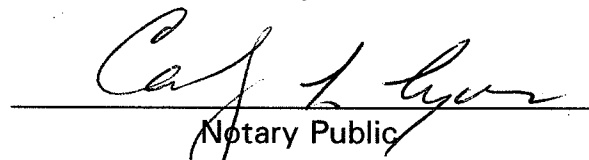
That his qualifications are a matter of record in the Federal Communications Commission;

That the attached engineering report was prepared by him or under his supervision and direction and

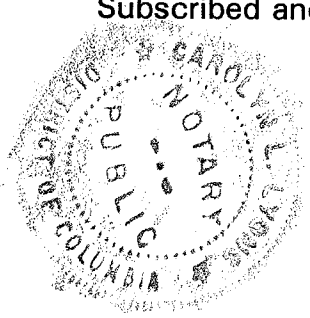
That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.

  
Donald G. Everist  
District of Columbia  
Professional Engineer  
Registration No. 5714

Subscribed and sworn to before me this 14<sup>th</sup> day of July, 2010.

  
Notary Public

My Commission Expires: 2/28/2013



### INTRODUCTION

This engineering statement has been prepared on behalf of Oklahoma Educational Television Authority, permittee of DTV translator K18IZ-D, to serve Grandfield, Oklahoma. This statement supports the permittee's request for modification of the outstanding construction permit, FCC File No. BNPDTT-20090825BVS. This submission requests to change site and operate at a 15 kW directional ERP at 653.1 meters RC/AMSL. Currently, K18IZ-D is authorized on Channel 18 with 15 kW non-directional at RC/AMSL of 653 meters. It is proposed to move to the KJTL antenna site and to operate from the KJTL decommissioned Channel 18 analog antenna.

### TRANSMITTER SITE

The existing antenna site and the structure will not be significantly altered. The existing tower is located 1.5 miles southwest of Grandfield and bears the antenna structure registration number 1050255. The geographic coordinates of the existing site follow below.

North Latitude: 34° 12' 05"

West Longitude: 98° 43' 45"

NAD-27

The antenna is top-mounted on an existing tower structure.

### EQUIPMENT DATA

Transmitter:	Type-approved
Transmission Line:	Myat, Type 6-1/8" rigid copper, 323.1 meters (1060 feet) with 77.1% efficiency 0.107 dB loss/100 ft

Antenna: Harris, Type TWS-30C directional, with a gain of 60 and 0.70 electrical beamtilt (see Exhibit E-2)

POWER DATA

Transmitter:	0.325 kW	-4.88 dBk
Transmission Line Loss:	77.1%	1.13 dB
Input Into Antenna:	0.250 kW	6.02 dBk
Antenna Gain:	60	17.78 dB
ERP:	15 kW	11.76 dBk

The existing structure will not require any modification of tower or tower height.

ELEVATION DATA  
(unchanged)

Elevation of site above mean sea level	337.7 meters (1107.9 feet)
Center of radiation of antenna above ground level	315.4 meters (1034.8 feet)
Center of radiation of antenna above mean sea level	653.1 meters <sup>1</sup> (2142.7 feet)
Overall height of existing structure above ground	327 meters (1072.8 feet)

The antenna is top-mounted on an existing tower structure.

<sup>1</sup>Slight change in height results due to updated information.

### Allocation

The proposed digital operation on Channel 18 conforms to the requirements of Sections 74.709, 74.793(e), 74.793(g), 74.793(h) 74.794(b) and 73.1030 of the Commission's Rules. The requirements of these sections regarding this proposed Channel 18 operation are met through demonstration of Longley-Rice prediction methodology as shown in Table I. The proposed digital television translator station will not cause any objectionable interference to any existing or proposed full-service NTSC or DTV station or LPTV/TV translators.

### Interference Analysis

A study of predicted interference caused by the proposed K18IZ-D digital television translator station operation has been performed as shown in Table I using the Longley-Rice program for which the source data has been posted by the Commission on its website at [http://www.fcc.gov/oet/dtv/dtv\\_apps.html](http://www.fcc.gov/oet/dtv/dtv_apps.html). The FCC's FORTRAN-77 code was modified only to the extent necessary (primarily input/output handling) for the program to run on a Microsoft Windows XP platform. Comparison of service/interference areas and population indicates this model closely matches the FCC's digital low-power TV/translator evaluation program. Best efforts have been made to use data and calculation identical to the FCC's program with the [simple emission] mask. The model employs the Longley-Rice propagation methodology and evaluates in grid cells of approximately 1 sq. km. Using 3-second terrain data sampled approximately every 1.0 km at one-degree azimuth intervals with 2000 census centroids, all studies are based upon data in the current CDBS database update of the FCC's engineering database. A Longley-Rice study was performed with the proposed K18IZ-D analog television

translator facilities and all relevant stations listed in the pending application on file with the FCC and updated in Table I.

#### Other Stations

Besides KJTL-DT, there are no other television broadcast stations located within 0.5 km of the proposed site. No objectionable interference problems are anticipated, however, if any problems occur, the permittee will take the necessary steps to resolve them. There are no radio stations (AM or FM) within 3.2 km of the proposed site.

#### Environmental Statement

The following broadcast stations are operating from the tower:

KJTL-DT (Licensed)

K18IZ-D (Proposed)

The radiofrequency field level ("RFF") contribution of the these transmitters will be calculated and summed to form a total representative value.

#### **KJTL-DT (Licensed)**

Channel 15    Freq: 476-482 MHz Range

$$S = \frac{33.4 (F^2) ERP}{R^2} \quad \begin{array}{ll} ERP = & 1000 \text{ kW (Horizontal only)} \\ R = & 251.9 \text{ meters (antenna height above ground -2 meters)} \\ F = & 0.1 \text{ (10-90 degrees)} \end{array}$$

$$S \leq 5.3 \mu\text{W}/\text{cm}^2$$

The limit for an uncontrolled environment (general population) for this frequency is 319.3  $\mu\text{W}/\text{cm}^2$ .

**KJTL-DT contributes less than 1.7% RFF level for an uncontrolled environment (general population) two meters above the ground.**

**K18IZ-D** (Proposed)

Channel 18 (z)	Freq: 494-500 MHz Range
$S = \frac{33.4 (F^2) ERP}{R^2}$	ERP = 15,000 (Horizontal only)
	R = 313.3 meters (antenna height above ground -2 meters)
	F = 0.1 (assumed) 5 to 90 degrees

$$S \leq 1 \mu\text{W}/\text{cm}^2$$

The limit for an uncontrolled environment (general population) for this frequency is  $331.3 \mu\text{W}/\text{cm}^2$ .

**K18IZ-D contributes less than one percent RFF level for an uncontrolled environment (general population) two meters above the ground.**

Therefore the total RFF percentage two meters above the ground at the highest RFF point will still be less than two percent of the limit of the FCC guidelines for the general population, when all transmitters on the tower are operational.

The permittee indicates that all authorized personnel climbing the tower will be alerted to the potential zones of high field levels, and if necessary, the station will operate with reduced power or terminated power should the situation require.

#### Environmental Assessment

An environmental assessment ("EA") is categorically excluded under Section 1.1306 of the FCC Rules and Regulations as the building was constructed prior to the requirements specified in WT Docket No. 03-128 and the permittee indicates:

- (a)(1) The existing tower is not located in an officially designated wilderness area.
- (a)(2) The existing tower is not located in an officially designated wildlife preserve.

- (a)(3) The proposed facilities will not affect any listed threatened or endangered species or habitats.
- (a)(3)(ii) The proposed facilities will not jeopardize the continued existence of any proposed endangered or threatened species or likely to result in the destruction or adverse modification of proposed critical habitats.
- (a)(4) The proposed facilities located on a tower which was built prior to the adoption of WT Docket No. 03-128 and is grandfathered and has not affected any known districts, sites, buildings, structures, or objects significant in American history, architecture, archaeology, engineering, or culture.
- (a)(5) The existing support structure is not located near any known Indian religious sites.
- (a)(6) The existing support structure is not located in a flood plain.
- (a)(7) The installation of the DLPTV facilities on an existing guyed tower using an existing (former KJTL analog antenna) will not involve a significant change in surface features of the ground in the vicinity of the building.
- (a)(8) It is not proposed to equip the tower with high intensity white lights unless required by the FAA.
- (b) Workers and the general public will not be subjected to RFF levels in excess of the current FCC guidelines contained in OET Bulletin 65, Edition 97-01 and Supplement A.



ABOVE MEAN SEA LEVEL

ABOVE GROUND

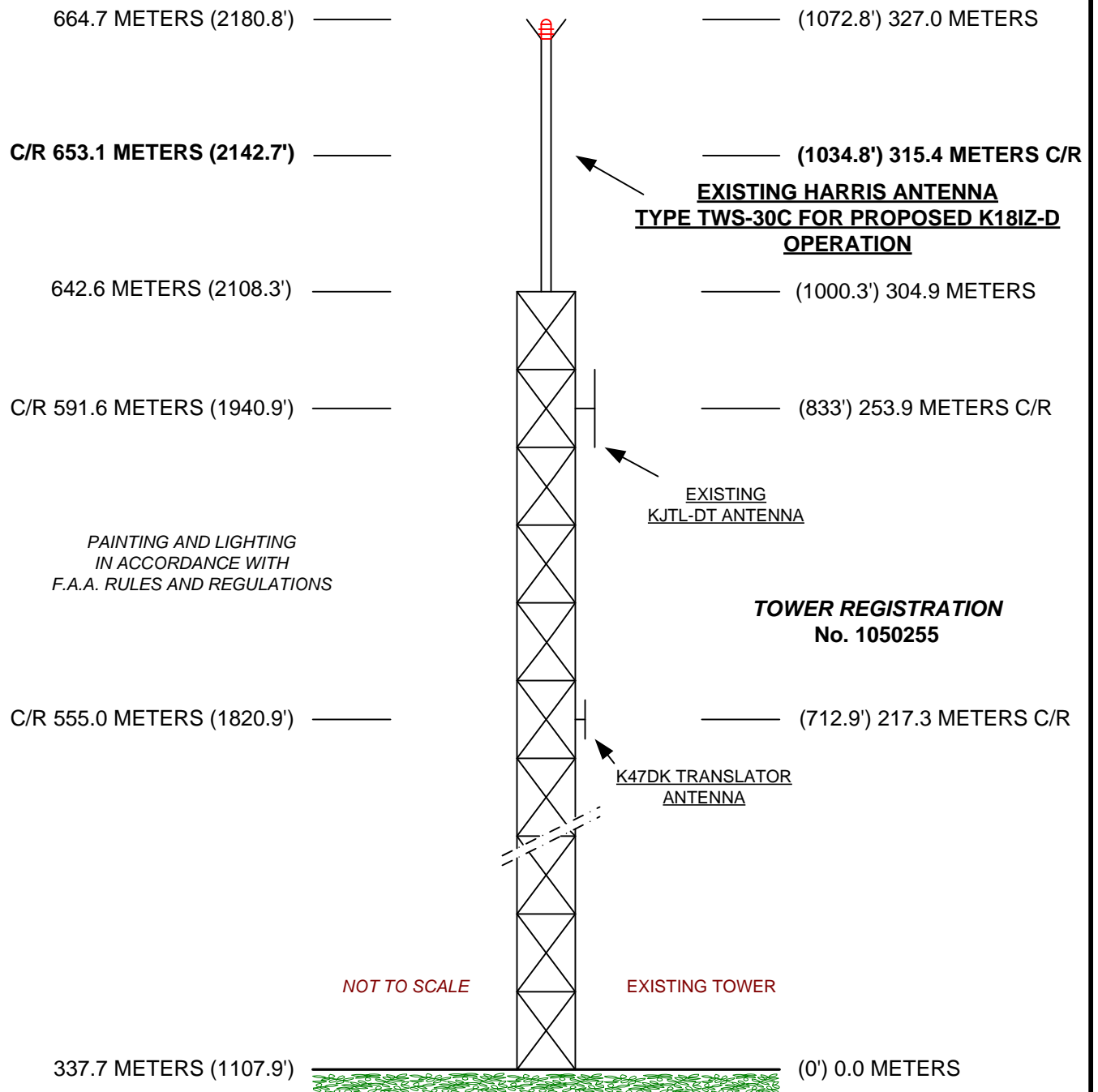


EXHIBIT E-1  
VERTICAL SKETCH  
FOR THE PROPOSED LDTV OPERATION OF  
**K18IZ-D, WICHITA FALLS, TEXAS**  
JUNE 2010

COHEN, DIPPELL AND EVERIST, P.C.

EXHIBIT E-2

ANTENNA MANUFACTURER DATA

K18IZ-D, GRANDFIELD, OKLAHOMA

# Electrical Specifications

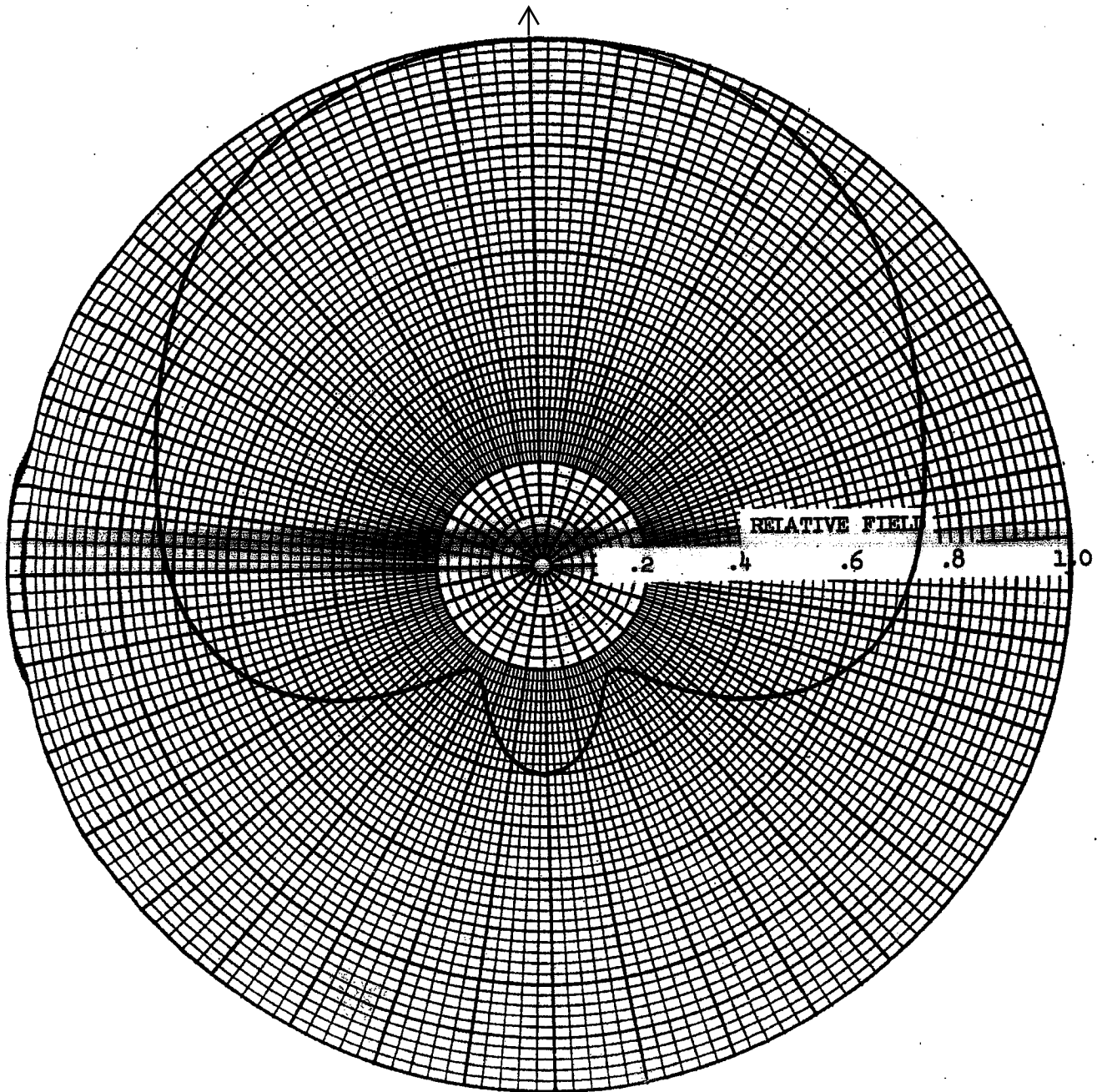
FUNCTION	CHARACTERISTIC
Vertical power gain, main lobe. (RMS gain)	30.00 (14.78 dB)
Vertical power gain, horizontal	8.32 (9.20 dB)
Horizontal gain, main lobe	2.0 (3.01 dB)
Maximum overall gain	60.0 (17.8 dB)
Peak Visual Power Rating Including 20% Aural Power	60 kW (17.8 dB)
Electrical beam tilt	-0.7°
Vertical Pattern Drawing No.	111384-1
Horizontal Patter Drawing No.	111384-2

Table 1-2. Mechanical Characteristics

FUNCTION	CHARACTERISTIC
Overall height of antenna (Including lightning protector)	71.604 ft.
Radiator center height above antenna base	33.6 ft.
Input Connection	6-1/8", 75 ohm
Moment M @ 50 PSF	101,000 ft. lbs.
Horizontal Shear S @ 50 PSF	2,910 lbs.
Weight W	10,400 lbs.

CALCULATED HORIZONTAL FIELD PATTERN

TWS-30C



POWER GAIN = 2.0

PATTERN NO. 111384-2



**HARRIS**

HARRIS CORPORATION BROADCAST DIVISION  
P.O. BOX 4290, QUINCY, IL 62305-4290



**HARRIS**

HARRIS CORPORATION BROADCAST DIVISION  
P.O. BOX 4290, QUINCY, ILLINOIS 62305 U.S.A.

CALCULATED ELEVATION PLANE PATTERN

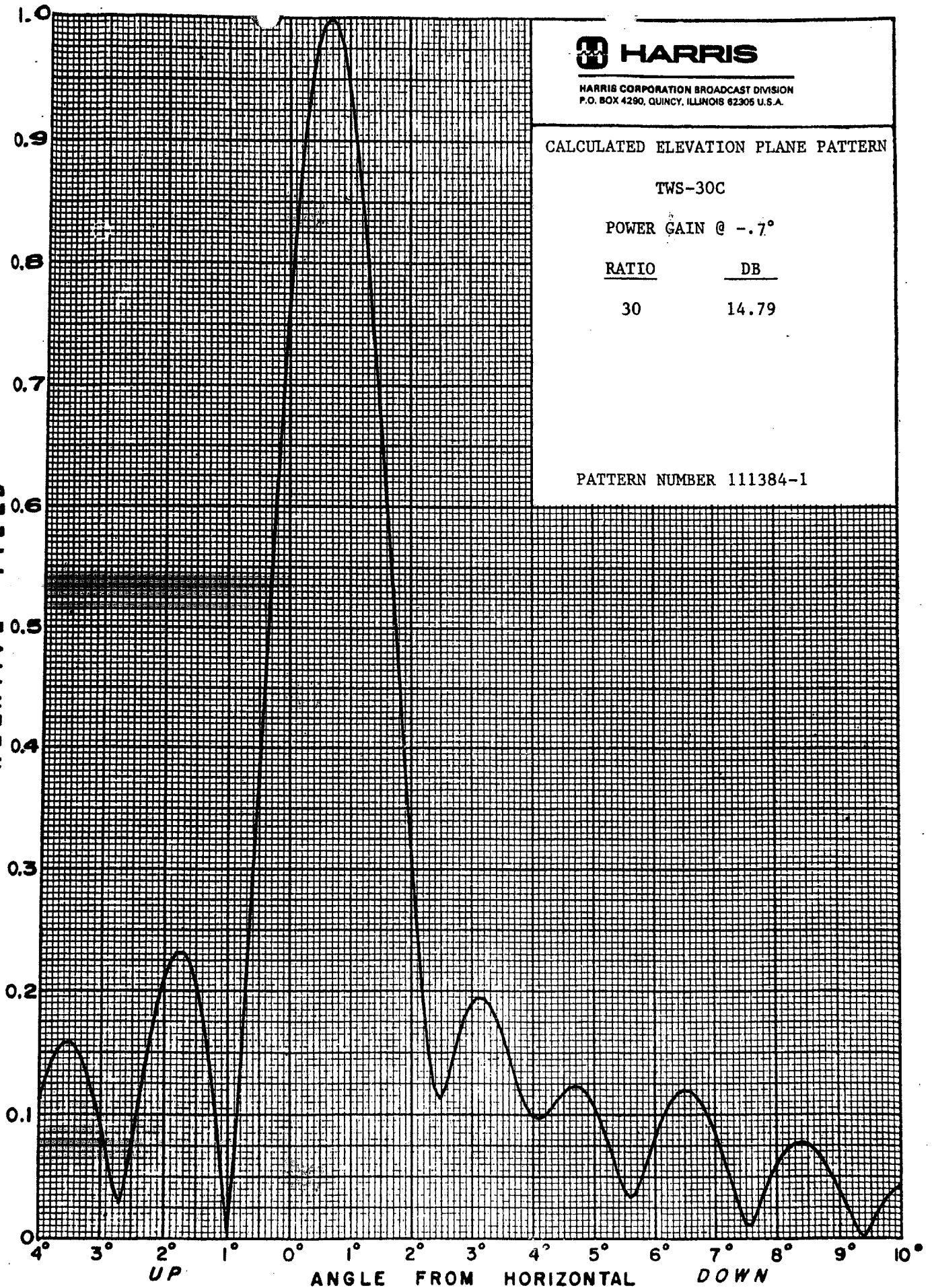
TWS-30C

POWER GAIN @  $-0.7^\circ$

<u>RATIO</u>	<u>DB</u>
30	14.79

PATTERN NUMBER 111384-1

RELATIVE FIELD



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HORIZONTAL PATTERN FOR  
K18IZ-D, GRANDFIELD, OKLAHOMA  
JUNE 2010

<u>Azimuth</u>	<u>Relative Field</u>	<u>Azimuth</u>	<u>Relative Field</u>
0	0.71	180	0.72
10	0.74	190	0.675
20	0.775	200	0.615
30	0.82	210	0.515
40	0.87	220	0.395
50	0.92	230	0.275
60	0.955	240	0.24
70	0.98	250	0.3
80	0.99	260	0.37
90	1	270	0.4
100	0.99	280	0.375
110	0.98	290	0.31
120	0.955	300	0.245
130	0.92	310	0.27
140	0.875	320	0.375
150	0.825	330	0.505
160	0.78	340	0.6
170	0.745	350	0.67

Note: Slight changes in field pattern results due to updated information.

COHEN, DIPPELL AND EVERIST, P.C.

TABLE I  
PREDICTED DLPTV LONGLEY-RICE INTERFERENCE ANALYSIS  
FOR THE PROPOSED OPERATION OF  
K18IZ-D, GRANDFIELD, OKLAHOMA  
CHANNEL 18 15 KW DA ERP 653.1 METERS RCMSL  
USING THE EXISTING KJTL(TV) ANTENNA  
AND THE SIMPLE EMISSION MASK  
JUNE 2010

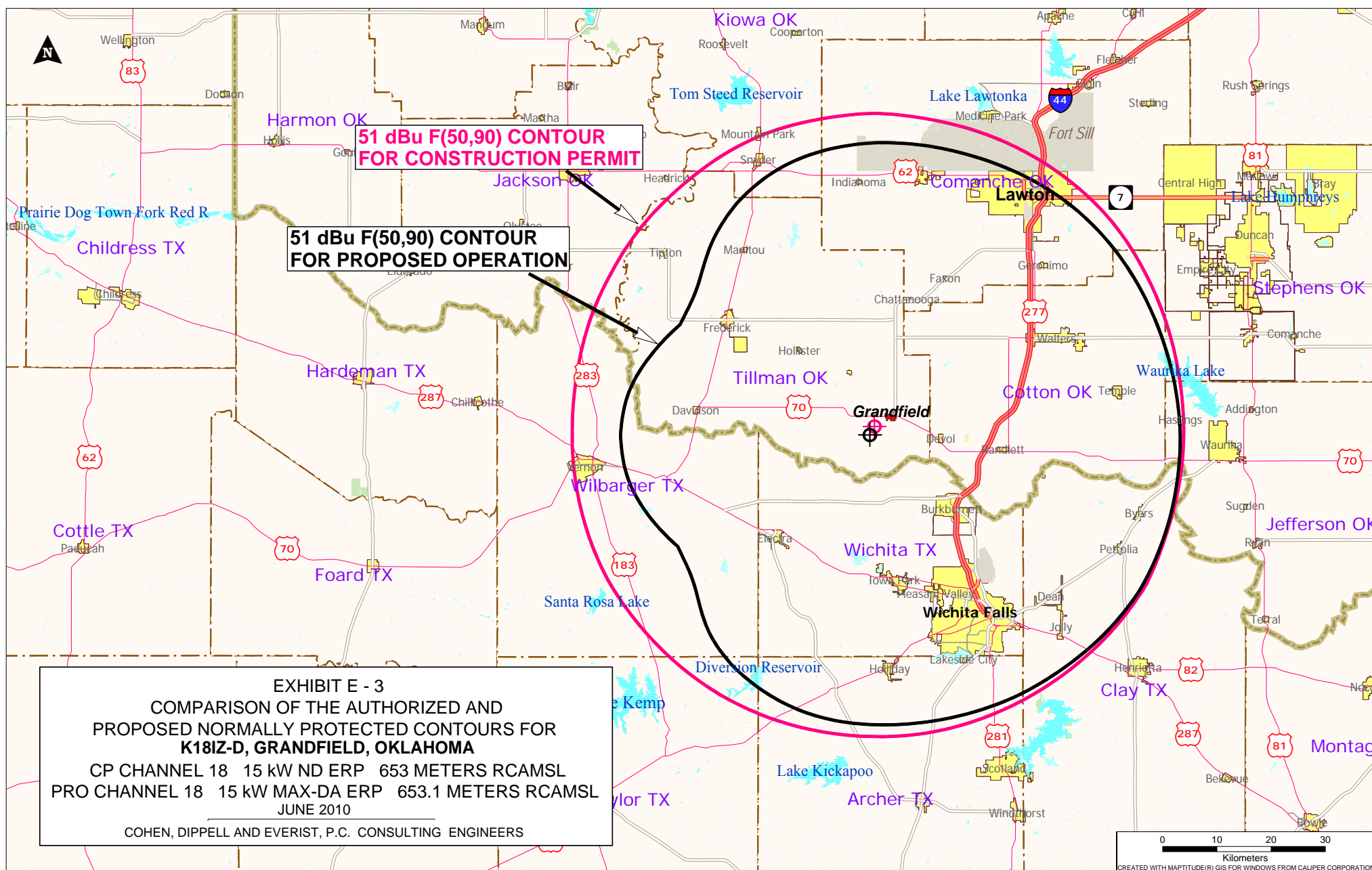
<u>Channel</u>	<u>Call</u>	<u>City/State</u>	<u>Dist(km)</u>	<u>Status</u>	<u>FCC File No.</u>	<u>Result</u>
14	KTWW-LP	WICHITA FALLS TX	38	CP	BDISTTL-20060403AQB	No interference
17	KKTM-LP	ALTUS OK	74	LIC	BLTTL-20041001AFP	No interference
17	K17FB	ARDMORE OK	142.7	APP	BDFCDTT-20090821AAJ	0.00%
17	K17FB	ARDMORE OK	142.7	LIC	BLTT-20030501ABB	0.00%
17	KLHO-LP	OKLAHOMA CITY OK	174	LIC	BLTTL-19990512JH	0.00%
17	K58CS	SAYRE OK	138.7	CP	BDISTT-20060719ABO	No interference
17	K17GY	GAINESVILLE TX	90.3	APP	BNPTTL-20000830BLR	No interference
17	NEW	RANGER TX	181.9	APP	BMJADTL-20100524AGL	0.00%
17	NEW	RANGER TX	181.9	APP	BNPTTL-20000831AXP	0.00%
17	NEW	SHAMROCK TX	177.7	APP	BNPDTL-20100416ABJ	0.00%
18	KDNT-LP	ALLEN OK	216.1	LIC	BLTTL-20060109ADC	No interference
18	NEW	CLINTON OK	148.7	APP	BNPDTL-20100406ACG	No interference
18	K18HX-D	HOLLIS OK	115.7	CP MO	BMPDPTT-20091221ACU	0.02%
18	K18BV	MAY, ETC. OK	265.7	LIC	BLTVL-19880304IK	No interference
18	KEGG-LD	MCALESTER OK	272.5	LIC	BLDTL-20100311ACU	No interference
18	KTEW-CA	PONCA CITY OK	310.4	CP	BDISDTA-20090814AAQ	No interference
18	KJTN-LP	ABILENE TX	216.5	LIC	BLTTL-20051215ABA	No interference
18	K18HL	AMARILLO TX	311.1	CP	BPTTL-20090824AMG	No interference
18	K18HL	AMARILLO TX	311.1	LIC	BLTTL-20070730AKU	No interference
18	KPFW-LP	DALLAS TX	238.4	CP	BDISDTL-20091007ADI	No interference
18	KDNT-LP	DENISON TX	205.7	CP	BPTTL-20071203ADR	No interference
18	KTXA	FORT WORTH TX	246.9	LIC	BLCDDT-20001130ACY	0.01%
18	KGSW-LP	KEENE TX	238.1	CP	BDISDTL-20090630AFO	0.00%
18	KLOD-LP	LUBBOCK TX	300.9	CP	BDISTTL-20060403ABD	No interference
18	NEW	LUBBOCK TX	297.8	APP	BDCCDTL-20061030AGA	No interference
18	KXVZ-LP	PLAINVIEW TX	281.4	LIC	BLTTL-20061218ABI	No interference
18	NEW	TAHOKA TX	317.5	APP	BNPDTL-20100323AIR	No interference
19	K19AA-D	ALTUS OK	75.9	LIC	BLDTT-20091229ACU	No interference



COHEN, DIPPELL AND EVERIST, P.C.

TABLE I  
PREDICTED DLPTV LONGLEY-RICE INTERFERENCE ANALYSIS  
FOR THE PROPOSED OPERATION OF  
K18IZ-D, GRANDFIELD, OKLAHOMA  
CHANNEL 18 15 KW DA ERP 653.1 METERS RCAMSL  
USING THE EXISTING KJTL(TV) ANTENNA  
AND THE SIMPLE EMISSION MASK  
JUNE 2010

<u>Channel</u>	<u>Call</u>	<u>City/State</u>	<u>Dist(km)</u>	<u>Status</u>	<u>FCC File No.</u>	<u>Result</u>
19	KUOT-CA	OKLAHOMA CITY OK	173.9	CP	BPTTA-20060111ACN	No interference
19	KUOT-CA	OKLAHOMA CITY OK	173.9	LIC	BLTTA-20040811ADD	0.00%
19	KUOT-CA	OKLAHOMA CITY OK	173.9	CP	BDFCDTA-20090812ACU	No interference
19	NEW	JOLLY TX	50.3	APP	BNPDTL-20100510AGJ	1.25%
20	K20HO	LAWTON OK	61.4	LIC	BLTT-20050916AAW	No interference
20	K20DN	WICHITA FALLS TX	39	LIC	BLTTL-19931112IA	No interference
25	K25IC	LAWTON OK	47.3	CP	BPTTL-20070410ADR	No interference
25	K25IC	LAWTON OK	51.1	LIC	BLTTL-20070212ACG	0.00%
25	KHWF-LP	WICHITA FALLS TX	25.7	LIC	BLTTL-20080813AAU	No interference
26	K26DL	WICHITA FALLS TX	37.2	LIC	BLTT-19931029IL	No interference



### 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: \_\_\_\_\_
2. Translator Input Channel No. \_\_\_\_\_
3. Station proposed to be rebroadcast:

Call Sign	City	State	Channel
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4. Antenna Location Coordinates: (NAD 27)

\_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " ☐ N ☐ S Latitude  
\_\_\_\_\_ ° \_\_\_\_\_ ' \_\_\_\_\_ " ☐ E ☐ W Longitude

5. Antenna Structure Registration Number: \_\_\_\_\_

☐ Not applicable ☐ See Explanation in Exhibit No. ☐ FAA Notification Filed with FAA

6. Antenna Location Site Elevation Above Mean Sea Level: \_\_\_\_\_ meters
7. Overall Tower Height Above Ground Level: \_\_\_\_\_ meters
8. Height of Radiation Center Above Ground Level: \_\_\_\_\_ meters
9. Maximum Effective Radiated Power (ERP): \_\_\_\_\_ kW
10. Transmitter Output Power: \_\_\_\_\_ kW

11. a. Transmitting Antenna: ☐ Nondirectional ☐ Directional ☐ Directional composite

Manufacturer	Model
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- b. Electrical Beam Tilt: \_\_\_\_\_ degrees ☐ Not applicable

c. Directional Antenna Relative Field Values:

Rotation: \_\_\_\_\_ ° ☐ No rotation ☐ N/A (Nondirectional)

Degree	Value	Degree	Value	Degree	Value	Degree	Value	Degree	Value	Degree	Value
0		60		120		180		240		300	
10		70		130		190		250		310	
20		80		140		200		260		320	
30		90		150		210		270		330	
40		100		160		220		280		340	
50		110		170		230		290		350	
Additional Azimuths											

**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.**

12. **Out-of-Channel Emission Mask:** Simple ☐ Stringent ☐

**CERTIFICATION**

13. **Interference.** 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. ☐ Yes ☐ No 

See Explanation in Exhibit No.

14. **Environmental Protection Act.** 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 **Exhibit is required.** ☐ Yes ☐ No 

See Explanation in Exhibit No.

Exhibit No.

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. **Channels 52-59.** If the proposed channel is within channels 52-59, the applicant certifies compliance with the following requirements, as applicable:

☐ The applicant is applying for a digital companion channel for which no suitable channel from channel 2-51 is available.

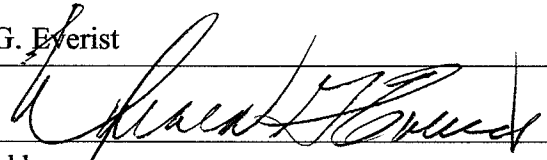
☐ Pursuant to Section 74.786(d), the applicant has notified, within 30 days of filing this application, all commercial wireless licensees of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies 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.

**PREPARER'S CERTIFICATION ON PAGE 8 MUST BE COMPLETED AND SIGNED.**

16. **Channels 60-69.** If the proposed channel is within channels 60-69, the applicant certifies compliance with the following requirements, as applicable:

- ☐ Pursuant to Section 74.786(e), the applicant has notified, within 30 days of filing this application, all commercial wireless licensees 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,
- ☐ 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 agreement(s) with 700 MHz public safety regional planning committee(s) and state frequency 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.
- ☐ Pursuant to Section 74.786(e), an 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.

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 Donald G. Everist		Relationship to Applicant (e.g., Consulting Engineer) Consulting Engineer	
Signature 		Date July 14, 2010	
Mailing Address Cohen, Dippell and Everist, P.C., 1300 L Street, NW, Suite 1100			
City Washington		State or Country (if foreign address) DC	ZIP Code 20005
Telephone Number (include area code) (202) 898-0111		E-Mail Address (if available) cde@attglobal.net	

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).