

ENGINEERING STATEMENT
RE APPLICATION TO INCREASE
EFFECTIVE RADIATED POWER
ON BEHALF OF
OKLAHOMA EDUCATIONAL TELEVISION AUTHORITY
KOED-TV, TULSA, OKLAHOMA
CHANNEL 11 50 KW ERP 521 METERS HAAT

MARCH 2011

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)

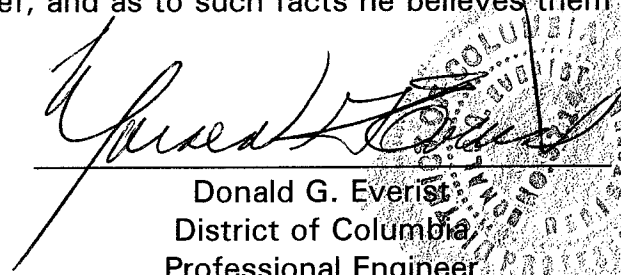
Donald G. Everist, being duly sworn upon his oath, deposes and states that:

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 1420 N Street, N.W., Suite One, Washington, D.C. 20005;

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

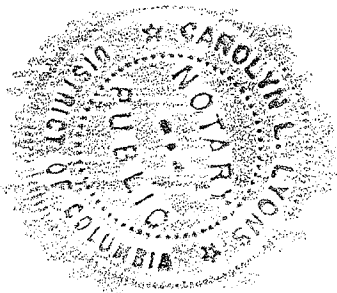
That the attached engineering report was prepared by him or under his supervision and direction and

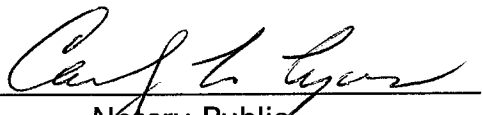
That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.



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

Subscribed and sworn to before me this 14th day of March, 2011.





Notary Public

My Commission Expires: 2/28/2013

This engineering statement has been prepared in support of an application for outstanding construction permit on behalf of Oklahoma Educational Television Authority, licensee of KOED-TV, Tulsa, Oklahoma. The purpose of the application is to increase its effective radiated power (“ERP”) to 50 kW non-directional from the currently licensed 35 kW non-directional operation.

KOED-TV was licensed to operate on NTSC television Channel 11 with a maximum visual ERP of 316 kW and an antenna height above average terrain (“HAAT”) of 521 meters (1709 feet). KOED-TV was allocated DTV Channel 11 with facilities of 21.3 kW directional and HAAT of 521 meters in the revised DTV Table of Allotments. KOED-TV is licensed to operate DTV facilities of 35 kW non-directional at a height above average terrain of 521 meters. While the 35 kW licensed operation is projected to be essentially a match to the current Grade B contour, the KOED-TV staff reports that it has not been their experience. The staff of KOED-TV still is aware a short fall in reception. This follows the pattern reported in other markets. Section 73.622(e)(7) table for a HAAT of 520 meters permits an ERP 47 kW. The current RF system’s maximum and transmitter power output permits 50 kW. This only increases the 36 dBu F(50,90) contour less than 1 km above that permitted by the table. Based on an informal discussion with a FCC staff member, this slight increase would be acceptable.

Transmitter Site and Power Data

There are no AM stations located within 3.2 km of the proposed multi-tower site. There are three educational FM stations and five DTV stations within 100 meters after the DTV transition.

The DTV antenna is side-mounted on the existing multi-use tower. The KOED-TV antenna is located on an existing tower having a total overall structure height above ground of 560.5 meters (1839 feet). The existing transmitter site is located at 9850 South 273rd East Avenue, Oneta, Oklahoma 74429. The registration number for the existing tower is 1011355.

Since there is no change in overall height, FAA airspace approval is not required. Exhibit E-1 is a vertical sketch of the existing multi-use tower and the proposed transmitting antenna.

The geographic coordinates of the proposed site are as follows:

North Latitude: 36° 01' 15"

West Longitude: 95° 40' 32"

NAD-27

Equipment Data

Antenna: RCA, Model TW-9A11-R antenna with 0.75° electrical beam tilt. The vertical plane pattern and other exhibits required by Section 73.625(c) are herein included as Exhibit E-3.

Transmission Line: 579.1 meters (1900 ft) of Myat, Type 601-001 rigid, 50 ohm or equivalent

Power Data

Transmitter at filter output	7.48 kW	8.739 dBk
Transmission line efficiency/loss	74.3%	1.386 dB
Input power to the antenna	5.56 kW	7.447 dBk
Antenna power gain, Main Lobe	9.0	9.54 dB

Effective Radiated Power, Maximum	50 kW	16.99 dBk
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Elevation Data
(unchanged)

Vertical dimension for Channel 11 antenna	20.1 meters 66 feet
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Overall height above ground of the existing antenna structure (including beacon and lightning rod)	560.5 meters 1839 feet
--	---------------------------

Center of radiation of Channel 11 antenna above ground	499.9 meters 1640 feet
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Elevation of site above mean sea level	216.4 meters 710 feet
--	--------------------------

Center of radiation of Channel 11 antenna above mean sea level	716.3 meters 2350 feet
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Overall height above mean sea level of existing tower and stacked antenna (including beacon)	776.9 meters 2549 feet
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Antenna height above average terrain	521 meters 1709 feet
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Note: Slight height differences may result due to conversion to metric.

Allocation

An allocation study has not been performed as the requested channel remains unchanged from that specified in the Appendix B.

Interference Analysis

A study (Table I) of predicted interference caused by the proposed KOED-TV service has been performed using a version of the Longley-Rice program as described in OET Bulletin No. 69 (February 6, 2004) and the Public Notice, “Additional Application Processing Guidelines for Digital Television (DTV)” (August 1998). The FCC’s FORTRAN-77 code was modified only to the extent necessary (primarily input/output handling) for the program to run on a Windows XP platform. Comparison of service/interference areas and populations indicates that this model closely matches the FCC’s evaluation program. Best efforts have been made to use data and calculations identical to the FCC’s program. Any slight differences are attributable to compiler, operating system and/or processor characteristics. The effect of any variance in calculated population values versus the FCC’s program is minimized when differencing a given model’s results, such as calculating new interference as total interference less baseline interference. Any variance effect is further reduced when using ratios of calculated population values such as measuring the incremental population affected as a percent of the total population served. The model employs the Longley-Rice propagation methodology and evaluates in grid cells of approximately 4 km² using 3-second terrain data sampled approximately every 1.0 km at one degree azimuth intervals with 2000 census centroids.

The above considers all allotments in the final DTV Table of Allotments, Appendix B released March 6, 2008 and all relevant stations in the CDBS dated March 2, 2011. The interference analysis to potentially affected stations is summarized in Table I. The new interference to each

station with exception of KSWO-TV is less than 0.5%. An interference acceptance agreement with KSWO-TV is included with this filing (see Exhibit E-4).

Coverage

The average elevation data for 3.2 to 16.1 km along each radial are based upon 3-second NGDC profile data and conforms very closely to the terrain information of that determined by using the 7.5 minute topographic maps on file at the Commission.

The F(50,90) DTV coverage contour has been computed from reference to the propagation data for Channels 7-13, as published by the FCC in Figure 10 and Figure 10a, Section 73.699 of the FCC Rules and Regulations.

Utilizing the formula in Section 73.625(b)(2) of the Rules for the effective heights, it is found that the depression angle, A_h , varies from 0.62 to 0.64 degrees. Since the relative vertical field is greater than 90% of the maximum at these depression angles, the maximum power was used in determining the distance to the DTV contour.

Table II includes the distances to the 43 and 36 dBu F(50,90) coverage contours, the average elevation 3.2 to 16.1 km, and the antenna height above average terrain for the eight radials. Exhibit E-3 provides the 43 and 36 dBu F(50,90) coverage contours and demonstrates that the community of license is covered by the F(50,90) 43 dBu contour.

Total Radiofrequency Field Levels at the Multi-Use Tower Site

The total percentage of radiofrequency field levels ("RFF") can be calculated by combining the percentage contribution of each station. See Table II for detailed calculations.

The total “worst-case” post-transition RFF contribution of all stations two meters above the ground at the base of the multi-use tower is less than six (6%) of the FCC guidelines for an uncontrolled environment which is less than two (2%) of the proposed FCC guidelines for a controlled environment.

Authorized personnel and rigging contractors will be alerted to the potential zone of high field levels on the tower, and if necessary, the station will operate with reduced power or terminate the operation of the transmitter as appropriate when it is necessary for authorized personnel or contractors to perform work on the tower. Workers and the general public, therefore, will not be subjected to RFF levels in excess of the current FCC guidelines.

Environmental Assessment

An environmental assessment (“EA”) is categorically excluded under Section 1.1306 of the FCC Rules and Regulations as the tower was constructed prior to the requirements specified in WT Docket No. 03-128 and the licensee 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 tower is not located near any known Indian religious sites.
- (a)(6) The existing tower is not located in a flood plain.
- (a)(7) The installation of the DTV facilities on an existing guyed tower will not involve a significant change in surface features of the ground in the vicinity of the tower.
- (a)(8) It is not proposed to change the tower lighting 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 No. 65, Edition 97-01, dated August 1997 and Supplement A.

ABOVE MEAN SEA LEVEL

ABOVE GROUND

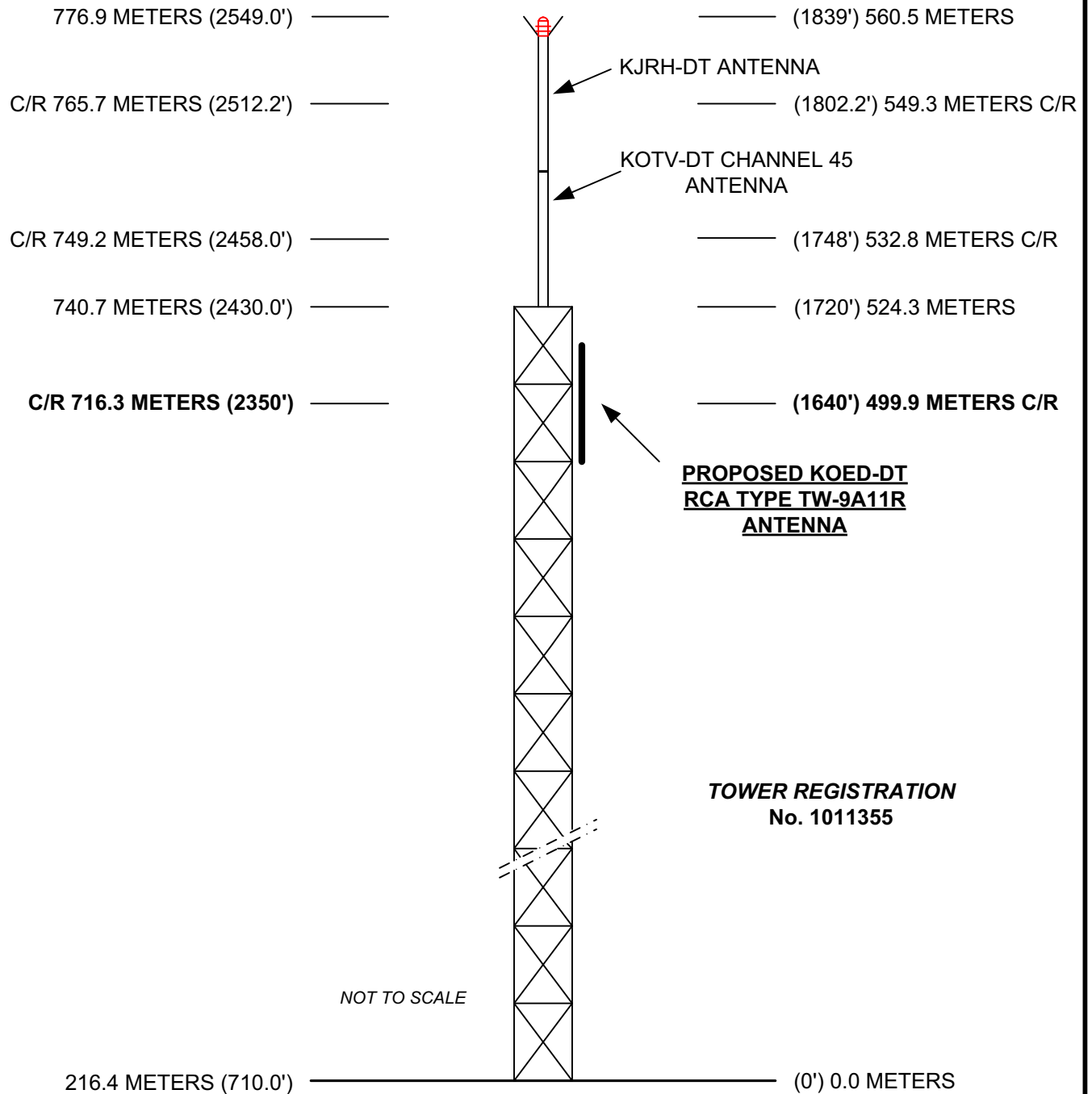


EXHIBIT E-1
TOWER SKETCH
KOED-DT, TULSA, OKLAHOMA
JUNE 2008

COHEN, DIPPELL AND EVERIST, P.C.

TABLE I
LONGLEY-RICE INTERFERENCE
FOR THE PROPOSED OPERATION OF
KOED-TV, TULSA, OKLAHOMA
CHANNEL 11 50 KW ERP 521 METERS HAAT
MARCH 2011

<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>
10	KFDF-CA	FORT SMITH AR	134.3	LIC	BLTVA-20011031ABC	No interference
10	KTUL	TULSA OK	7.9	LIC	BLCDT-20100505AGI	0.03%
11	KTWU	TOPEKA KS	338.3	LIC	BLEDT-20090917AAW	0.11%
11	KSWO-TV	LAWTON OK	341.9	LIC	BLCDT-20060707ADG	0.59% ¹
11	KTVT	FORT WORTH TX	400.2	PLN	DTVPLN-DTVPLN23422	0.00%

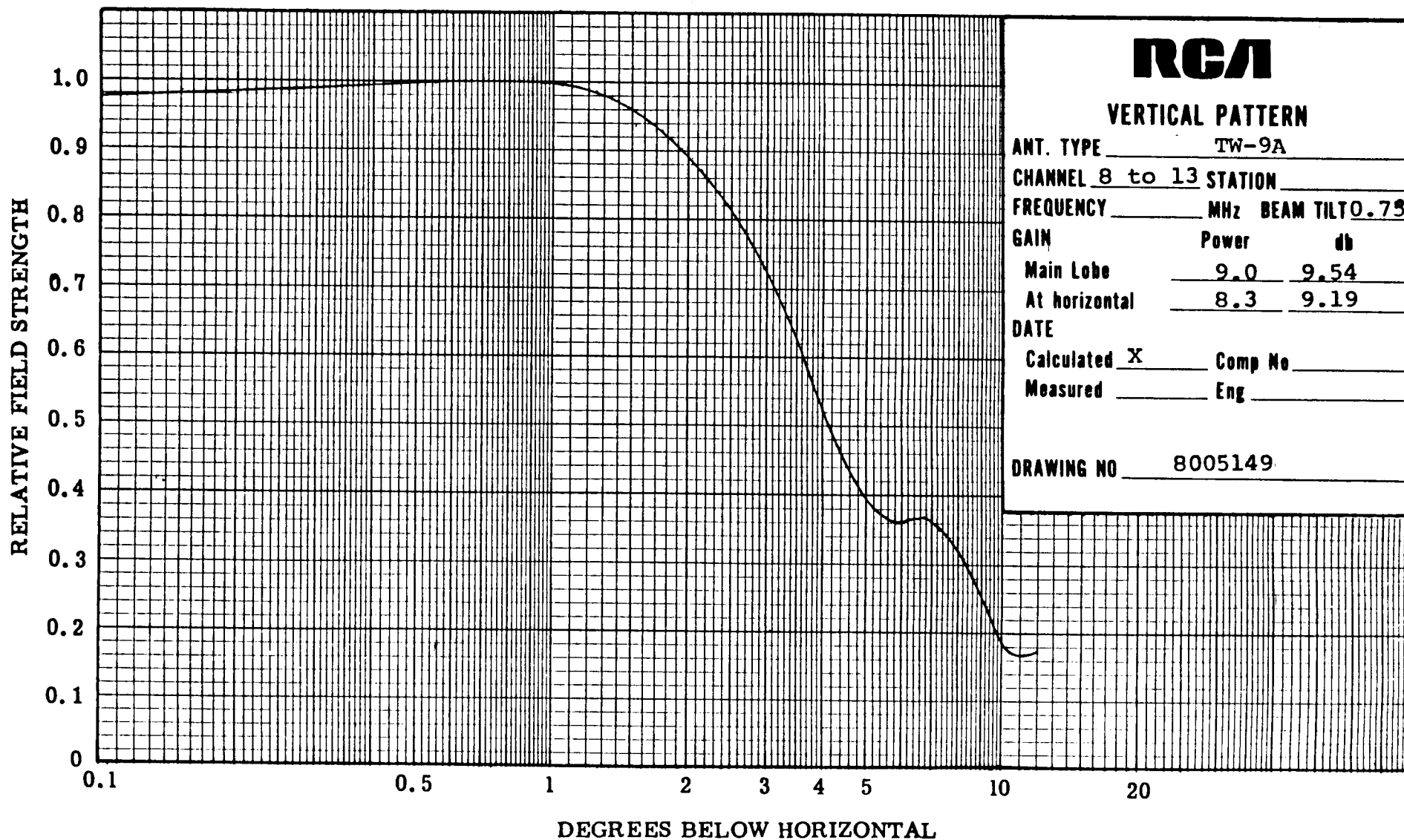
¹Agreement with KSWO-TV is included with this filing.

Cohen, Dippell and Everist, P.C.

EXHIBIT E-2

ANTENNA MANUFACTURER DATA

KOED-TV, TULSA, OKLAHOMA



COHEN, DIPPELL AND EVERIST, P.C.

TABLE II
COMPUTED COVERAGE DATA
FOR THE PROPOSED DTV OPERATION OF
KOED-TV, TULSA, OKLAHOMA
CHANNEL 11 50 KW ERP 521 METERS HAAT
MARCH 2011

Radial Bearing N ° E, T	Average* Elevation 3.2 to 16.1 km meters	Effective Height meters	Depression Angle	ERP At Radio Horizon kW	Distance to Contour F(50,90)	
					43 dBu City Grade km	36 dBu Noise-Limited km
0	195.3	521.0	0.632	50	108.2	122.6
45	175.4	540.9	0.644	50	109.3	123.9
90	174.8	541.5	0.645	50	109.3	123.9
135	188.2	528.1	0.637	50	108.6	123.0
180	191.5	524.8	0.635	50	108.4	122.8
225	196.9	519.4	0.631	50	108.1	122.5
270	208.0	508.3	0.624	50	107.4	121.9
315	213.8	502.5	0.621	50	107.0	121.6
Average	193					

*Based on data from FCC 3-second data base

DTV Channel 11 (198-204 MHz)
Average Elevation 3.2 to 16.1 km 193 meters AMSL
Center of Radiation 716.3 meters AMSL
Antenna Height Above Average Terrain 521 meters
Effective Radiated Power 50 kW (16.99 dBk) Max.

North Latitude: 36° 01' 15"
West Longitude: 95° 40' 32"

(NAD-27)

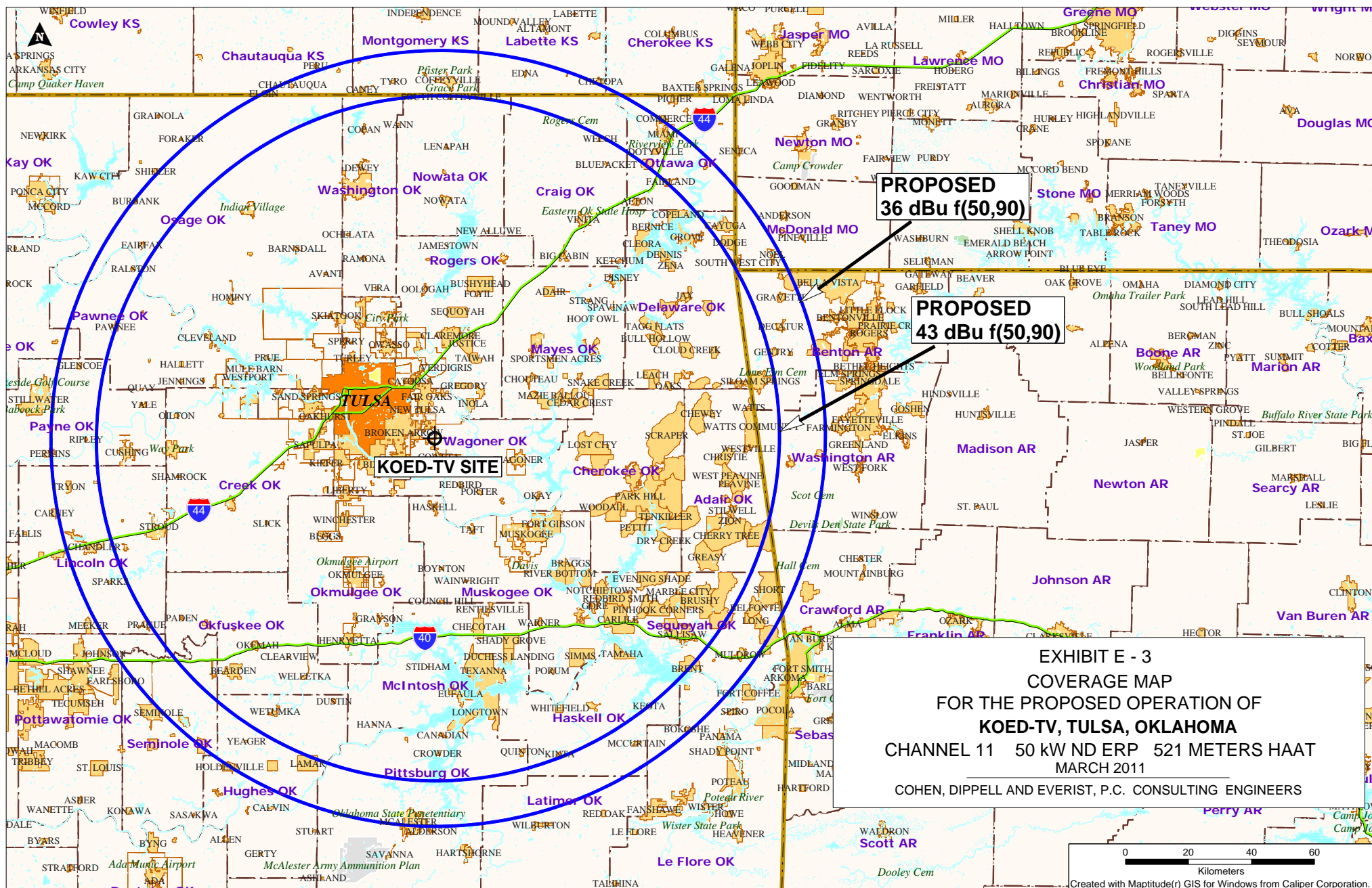


TABLE III
RFF ANALYSIS CONSIDERS STATIONS
IN THE VICINITY OF THE PROPOSED OPERATION OF
KOED-DT, TULSA, OKLAHOMA
MARCH 2011

[illegible]

Cohen, Dippell and Everist, P.C.

EXHIBIT E-4

INTERFERENCE AGREEMENT

KOED-TV, TULSA, OKLAHOMA

INTERFERENCE ACCEPTANCE AGREEMENT

This Interference Acceptance Agreement (the "Agreement") is entered into as of March ____, 2011 by and between Oklahoma Educational Television Authority ("OETA") and KSWO Television Company, Inc. ("KSWO").

1. OETA is the licensee of digital television station KOED-TV, FCC Facility ID No. 66195, Tulsa, Oklahoma.

2. KSWO is the licensee of digital television station KSWO-TV, FCC Facility ID No. 35645, Lawton, Oklahoma.

3. OETA desires to modify the authorized DTV facility for KOED-TV in order to maximize service to the public. OETA plans to file an application (the "Application") seeking FCC approval for a minor change to the KOED-TV facility in order to increase Effective Radiated Power from 35 kw to 50 kW. The Application will propose no other technical changes to the licensed KOED-TV facilities in FCC File No. BLEDT-20090615ABV.

4. The facility proposed by the Application is predicted to cause a very small amount of unique new interference to 0.17 percent of the population predicted to be served by the licensed facility of KSWO-TV, resulting in total interference to 0.59 percent (i.e., 0.09 percent over the FCC limit) of the population predicted to be served by the licensed facility of KSWO-TV.

5. KSWO hereby acknowledges and agrees to accept such unique new interference. KSWO understands that acceptance of such unique new interference from KOED-TV will not compromise KSWO's ability to serve KSWO-TV's community of license as required by all relevant FCC regulations. Proposed modifications of KOED-TV which, if implemented, would result in unique new interference to the service area population of KSWO-TV beyond the unique new interference agreed to in this paragraph 5 shall require the further written consent of KSWO.

6. In consideration for KSWO's agreement to accept interference resulting from the KOED-TV facilities proposed by the Application, OETA agrees to reimburse KSWO for engineering costs associated with the study of the impact of the Application on KSWO-TV, such costs not to exceed \$1,012.50 dollars. No consideration other than that specified by this Agreement has been received or promised by or to either OETA or KSWO in connection with this Agreement.

7. This Agreement may not be amended except by an instrument in writing signed on behalf of both of OETA and KSWO. This Agreement constitutes the entire agreement and understanding of OETA and KSWO and supersedes any and all prior agreements and understandings with respect to the subject matter hereof. Nothing in this Agreement express or implied is intended or shall be construed to give any rights to any person or entity other than OETA and KSWO and their respective successors and permitted assigns. This Agreement may be executed in counterpart signature pages, and each such counterpart signature page shall constitute one in the same original signature page. Counterparts may be exchanged between the parties by electronic mail. This Agreement may be filed by OETA with the Application to demonstrate KSWO's consent to the Application.

OKLAHOMA EDUCATIONAL
TELEVISION AUTHORITY

KSWO TELEVISION COMPANY, INC.

By: [Signature]

By: [Signature]

Title: Executive Director 3/16/11

Title: MAR 15 2011 [Signature]

SECTION VII - DTV Engineering

Complete Questions 1-5, and provide all data and information for the proposed facility, as requested in Technical Specifications, Items 1-13.

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 these 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.

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 on or before March 17, 2008 (45 days of the Report and Order in the Third DTV Periodic Review proceeding, MB Docket No. 07-91).

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. ☐ Yes ☐ 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. ☐ Yes ☐ No
- 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. ☐ Yes ☐ 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"). ☐ ☐ No
☐ 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. ☐ Yes ☐ No
☐ N/A
2. The proposed facility will not have a significant environmental impact, including exposure of workers or the general public to levels of RIF radiation exceeding the applicable health and safety guidelines, and therefore will not come within 47 C.F.R. Section 1.1307. ☐ Yes ☐ No

Applicant must **submit the Exhibit** called for in Item 13.

3. Pursuant to 47 C.F.R. Section 73.625, the DTV coverage contour of the proposed facility will encompass the allotted principal community. ☐ Yes ☐ 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. ☐ Yes ☐ No
5. The antenna structure to be used by this facility has been registered by the Commission and will not require reregistration 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. ☐ Yes ☐ No

SECTION VII - 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 _____ Analog TV, if any _____
2. Zone: ☐ I ☐ II ☐ III
3. Antenna Location Coordinates: (NAD 27)
- _____ ° _____ ' _____ " ☐ N ☐ S Latitude
_____ ° _____ ' _____ " ☐ E ☐ W Longitude
4. Antenna Structure Registration Number: _____
- ☐ Not applicable ☐ FAA Notification Filed with FAA
5. Antenna Location Site Elevation Above Mean Sea Level: _____ meters
6. Overall Tower Height Above Ground Level: _____ meters
7. Height of Radiation Center Above Ground Level: _____ meters
8. Height of Radiation Center Above Average Terrain: _____ meters
9. Maximum Effective Radiated Power (average power): _____ kW
10. Antenna Specifications:
- a.

Manufacturer	Model
--------------	-------
- b. Electrical Beam Tilt: _____ degrees ☐ Not Applicable
- c. Mechanical Beam Tilt: _____ degrees toward azimuth _____ degrees True ☐ Not Applicable
- Attach as an Exhibit all data specified in 47 C.F.R. Section 73.625(c).

Exhibit No.

- d. Polarization: ☐ Horizontal ☐ Circular ☐ Elliptical

TECH BOX

e. Directional Antenna Relative Field Values:

☐

Not applicable (Nondirectional)

Rotation: _____ °

☐

No rotation

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											

If a directional antenna is proposed, the requirements of 47 C.F.R. Section 73.625(c) must be satisfied. **Exhibit required.**

Exhibit No.

11. 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?

☐

Yes

☐

No

If "No," attach as an Exhibit justification therefore, including a summary of any related previously granted waivers.

Exhibit No.

12. 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 No.

13. **Environmental Protection Act. Submit in an Exhibit** the following:

Exhibit No.

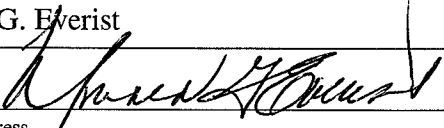
- a. If **Certification Checklist** Item 2 is answered "Yes," a brief explanation of why an Environmental Assessment is not required. Also describe in the Exhibit the steps that will be taken to limit RF radiation exposure to the public and to persons authorized access to the tower site.

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 radio frequency electromagnetic exposure in excess of FCC guidelines.

If **Certification Checklist** Item 2 is answered "No," an Environmental Assessment as required by 47 C.F.R. Section 1.1311.

Section VII -- Preparer's Certification

I certify that I have prepared Section VII (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 March 14, 2011	
Mailing Address Cohen, Dippell and Everist, P.C., 1420 N Street, NW, Suite One			
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).