

ENGINEERING STATEMENT
RE BROADCAST ENGINEERING DATA
APPLICATION FOR DISPLACEMENT OF A
LICENSED TELEVISION TRANSLATOR STATION
K20DY, BELGRADE, ETC., MONTANA
CHANNEL 17 1.53 KW DA ERP 1737 METERS RCAMSL

APRIL 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)

Martin R. Doczkat being duly sworn upon his oath, deposes and states that:

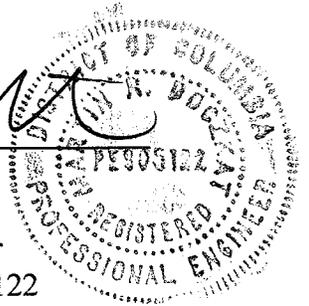
He is a graduate electrical engineer of the Pennsylvania State University, a Registered Professional Engineer in the District of Columbia, and is a staff engineer at Cohen, Dippell and Everist, P.C., Consulting Engineers, Radio - Television, with offices at 1300 L Street, N.W., Suite 1100, Washington,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

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

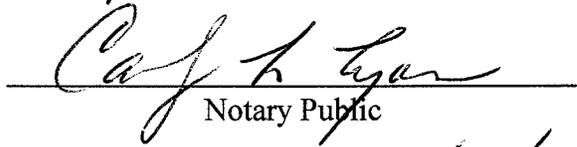
That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.



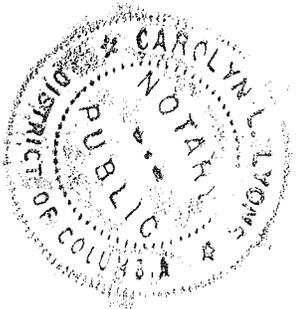
Martin R. Doczkat
District of Columbia
Professional Engineer
Registration No. PE905122



Subscribed and sworn to before me this 20th day of April, 2010.


Notary Public

My Commission Expires: 2/22/2013



Introduction

This engineering statement has been prepared in support of an application for digital displacement of a currently licensed television translator station (Facility ID 33758) on behalf of Montana State University, licensee of TV translator station K20DY, Belgrade, Montana.

K20DY is licensed to operate on NTSC television Channel 20 with a directional maximum visual effective radiated power (“ERP”) of 6.85 kW and an antenna radiation center above mean sea level (“RCAMSL”) of 1737.5 meters. K20DY is also authorized to construct digital facilities on Channel 20 with a directional ERP of 0.15 kW and a RCAMSL of 1737 meters (FCC File No. BDFCDTT-20061207ACC), but it has been displaced by KWYB(TV), DTV Channel 19, Butte, Montana, which prohibits expansion of K20DY on Channel 20 due to interference concerns.

The amount of predicted received interference to K20DY due to the relative location of this DTV full-service license is in accordance with Section 73.3572(a)(4)(iv)(B) of the FCC Rules since the licensed K20DY transmitter site is inside of the noise-limited contour of KWYB(TV), Butte, Montana, Channel 19, located 100.1 km away according to both DLPTV Longley-Rice analysis and LPONE analysis of the currently licensed K20DY facilities.

Hence, K20DY complies with the intent of this provision and therefore seeks to modify its authorization to operate on Channel 17 as requested herein.

The purpose of this application is to allow for a further increase of its ERP on Channel 17 that is not possible on Channel 20 due to first-adjacent channel interference caused to and from

the above full-service stations. K20DY proposes to construct digital TV translator facilities of 1.53 kW directional ERP at a RCAMSL of 1737.5 meters from its currently licensed site.

Transmitter Site

The currently licensed antenna is mounted on the existing tower where the authorized K20DY facility is currently located. The tower is located 4.5 miles southwest of Four Corners Junction where State Highways 191, 291, and 289 intersect. This location can be found on United States Geological Survey quadrangle map, Anceney, Montana. Antenna structure registration is not required. There are no airports within 8 km (5 miles) of the tower site and the overall height of the existing tower above ground level is less than 200 feet. The geographic coordinates of the site are as follows:

North Latitude: 45° 38' 15"

West Longitude: 111° 16' 01"

Elevation Data

Elevation of site above mean sea level	1706.5 meters 5598.8 feet
Overall height above ground of of existing antenna structure (including appurtenances)	31.5 meters 103.3 feet
Overall height above mean sea level of existing antenna structure (including appurtenances)	1738 meters 5702.1 feet
Center of radiation of antenna above ground level	30.5 meters 100.1 feet
Center of radiation of antenna above mean sea level	1737 meters 5698.8 feet

Equipment Data

Transmitter:	Type-approved
Emission Mask:	Simple
Transmission Line:	Andrew, Type HJ7-50A, 1-5/8", 40 meters with 86.5% efficiency
Antenna:	Scala, 4DR-8-2HW with maximum gain of 7.08 (8.5 dB) and no beam tilt

Power Data

Transmitter Power Output	0.25 kW	-6.02 dBK
Transmission Line Efficiency/Loss	86.5%	0.63 dB
Input Power to the Antenna	0.216 kW	-6.65 dBK
Antenna Power Gain Maximum	7.08	8.5 dB
Effective Radiated Power	1.53 kW	1.85 dBK

As indicated above, the transmitter with typical power output of 0.25 kW will deliver 0.216 kW to the input of the antenna. The antenna, having a maximum gain of 7.08, will produce maximum ERP of 1.53 kW at a bearing of N 15° E. A coverage map of the proposed facility has been included as Exhibit E-1 of this report. The antenna azimuth pattern should be on file at the Commission as the currently licensed directional “off-the-shelf” antenna for K20DY with no alterations has been proposed.

Other Broadcast Facilities

A brief analysis was completed to determine the presence of stations in the vicinity of the K20DY tower using the April 14, 2010, data contained within the Commission's Consolidated Database System. Three licensed and one authorized full-service FM radio stations (KBMC, KKQX, KSCY and KMTZ) and a licensed FM translator station (K218DN) were found within 500 meters of the tower. Also, two licensed analog low-power television or television translator stations (K26DE and K45EB) and an authorized digital low-power television or television translator (K39JY-D) station were also found within 500 meters in addition to the applicant's currently licensed and authorized K20DY facilities. The search did not return any AM stations within 5 km of the proposed site. Although no adverse effects are expected due to the proposed changes to K20DY, the applicant will install filters or take other measures necessary to resolve any problems provided they are related to the changes proposed in this application.

Allocation

The proposed digital operation on Channel 17 at Belgrade, Etc., Montana, conforms to the requirements of Sections 74.709, 74.793(e), 74.793(f), 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 17 operation of K20DY are met through demonstration of Longley-Rice prediction methodology where applicable, attached as Table I. The proposed digital low-power television station will not cause any objectionable interference to any existing or proposed full-service DTV station or LPTV/TV translators. Additionally, the proposed operation includes plans for installing a filter that will meet the simple emission mask with attenuation of at least 85 dB in the

L5 (1164-1215 MHz), L2 (1215-1240 MHz) and L1 (1559-1610 MHz) bands in order to comply with Section 74.794(b) of the FCC Rules.

Interference Analysis

A study of predicted interference caused by the proposed K20DY digital television translator operation has been performed 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. 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. 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 K20DY low-power digital facilities and all relevant stations listed in the FCC database as of March 31, 2010.

Environmental Statement

An evaluation has been made to determine compliance with the FCC specified standards for human exposure to radio frequency field ("RFF") as set forth in the OET Bulletin No. 65, Edition 97-01, August 1997. A proposed maximum effective radiated power of 1.53 kW,

antenna radiation center of 30.5 meters above ground level, and a downward radiation factor of 0.2 will cause less than $2.52 \mu\text{W}/\text{cm}^2$ near the base of the tower. This is less than 0.8% of the maximum uncontrolled exposure value of $327.3 \mu\text{W}/\text{cm}^2$ on Channel 20 which is less than 0.16% of the maximum controlled exposure value of $1636.7 \mu\text{W}/\text{cm}^2$ on Channel 20. K20DY is predicted to cause less than 5% of its maximum allowed controlled exposure value and is therefore not responsible for identifying other potential RFF contributors in order to ensure compliance with FCC guidelines for maximum permissible exposure since the area subject to predicted maximum levels of RF energy are confined within a barbed wire fenced area with four locked gates. In addition to the fencing surrounding the transmitter site, the area is rural and there is a locked cattle guard gate blocking entrance to the 3-mile access road leading to the transmitter site. Thus, the site is in a remote area not likely to be visited by the public and the area will be marked by appropriate warning signs.

Authorized personnel and rigging contractors will be alerted to the potential zone of high radiation on the tower, and if necessary, the station will operate with reduced power or terminate the operation of its 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 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 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 No. 65, Edition 97-01, dated August 1997 and Supplement A.

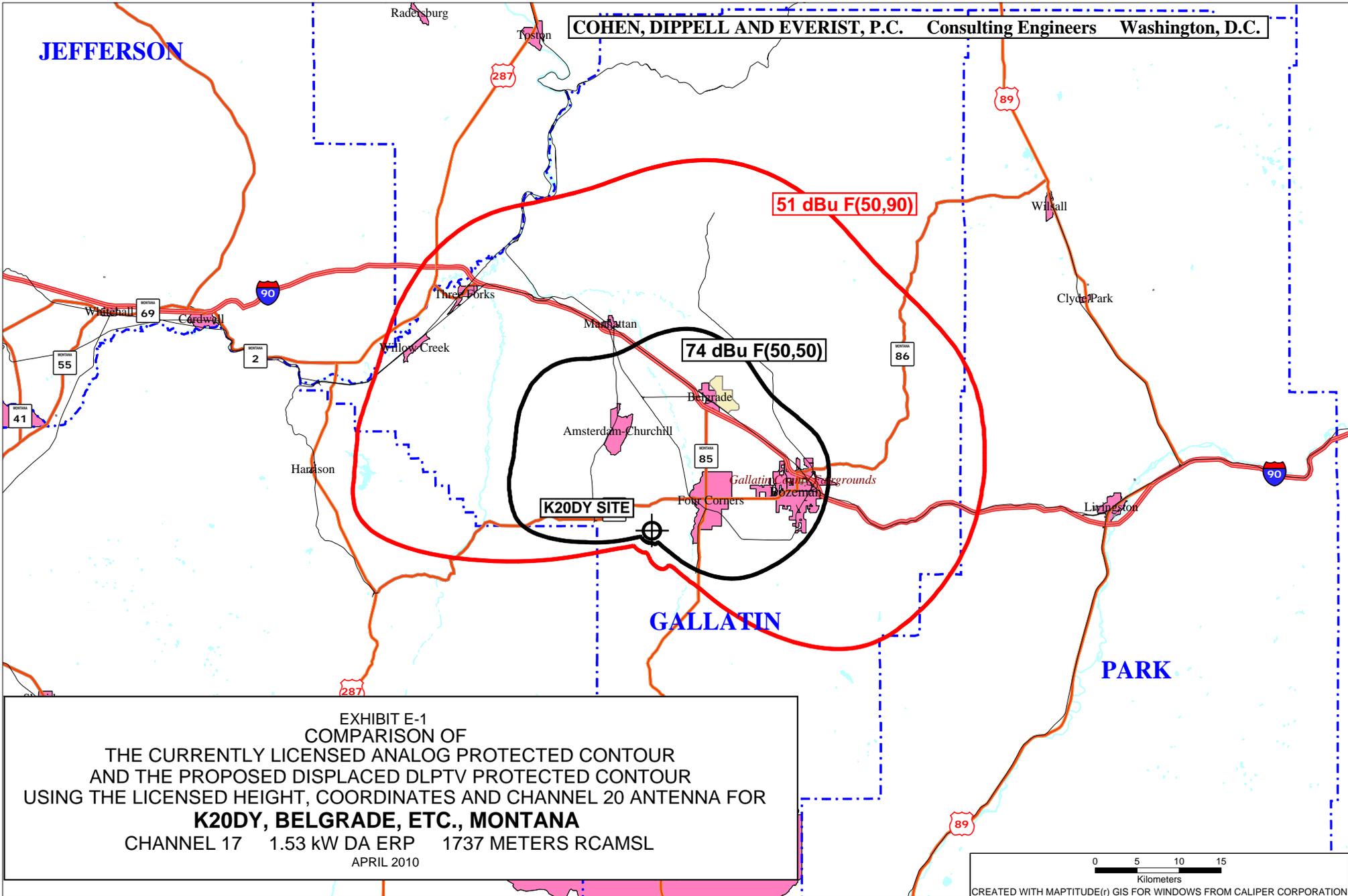


EXHIBIT E-1
COMPARISON OF
THE CURRENTLY LICENSED ANALOG PROTECTED CONTOUR
AND THE PROPOSED DISPLACED DLPTV PROTECTED CONTOUR
USING THE LICENSED HEIGHT, COORDINATES AND CHANNEL 20 ANTENNA FOR
K20DY, BELGRADE, ETC., MONTANA
CHANNEL 17 1.53 kW DA ERP 1737 METERS RCAMSL
APRIL 2010

COHEN, DIPPELL AND EVERIST, P.C.

TABLE I
PREDICTED DLPTV LONGLEY-RICE INTERFERENCE
FOR THE PROPOSED OPERATION FOR
K20DY, BELGRADE, ETC., MONTANA
CHANNEL 17 1.53 KW DA ERP 1737 METERS RCAMSL
USING THE SIMPLE EMISSION MASK
APRIL 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>
15	K15HI	BOZEMAN MT	16.6	CP MOD	BMP TTL-20070511ABO	No interference
15	K15HI	BOZEMAN MT	16.6	LIC	BL TTL-20070622ACD	No interference
17	KAID	CASCADE ID	404	APP	BDR TEDT-20090902ACG	0.00%
17	K17CO	GEORGETOWN ID	348.8	LIC	BL TT-19891215IC	0.00%
17	KISU-TV	POCATELLO ID	261.9	CP	BP EDT-20080620AGK	No interference
17	KISU-TV	POCATELLO ID	261.9	LIC	BLE DT-20030131AHZ	No interference
17	K69CM	BIG TIMBER, ETC. MT	38.7	CP	BD ISDTL-20090825BTV	<0.08%
17	NEW	BELT, ETC. MT	206.4	APP	BN P DTT-20090825BRY	No interference
17	K17JG-D	FERNDALE, ETC MT	342.5	LIC	BL DTT-20091210ADP	No interference
17	DKMMF	MISSOULA MT	245	CP	BPC DT-20080515AAK	No interference
17	NEW	PHILIPSBURG MT	177.9	APP	BN P DTT-20090831AAR	No interference
17	NEW	THOMPSON FALLS MT	374.7	APP	BN P DTT-20090825BPS	No interference
17	NEW	EVANSTON WY	366.4	APP	BN P TTL-20000831EHA	0.00%
17	NEW	JACKSON WY	245.2	APP	BN P TTL-20000830BKR	No interference
17	K65BW	MEETEETSE WY	249.2	APP	BD ISDTT-20090630AGZ	No interference
20	K20DY	BELGRADE, ETC. MT	0	LIC	BL TT-20050505ABO	No interference
25	KXLH-LP	HELENA MT	138.7	LIC	BL TT-19950928IK	0.00%

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 Martin R. Doczkat		Relationship to Applicant (e.g., Consulting Engineer) Consulting Engineer	
Signature 		Date April 20, 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).