

ENGINEERING EXHIBIT

Application for Class A Digital Television Station Construction Permit

prepared for

The Union Mission

WJGN-CA Chesapeake, Virginia

Facility ID 66549

Ch. 38 (Digital Displacement) 15 kW

Table of Contents

FCC Form 346, Section III – Engineering Data (Digital)

Exhibit 9

Statement A	Nature of the Proposal - Allocation Considerations
Figure 1	Coverage Contour Comparison
Table I	Interference Analysis Results Summary

Exhibit 10

Statement B	Environmental Considerations
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This material supplies a “hard copy” of the engineering portions of this application as entered July 26, 2010 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.

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 ROBERT J. CLINTON	Relationship to Applicant (e.g., Consulting Engineer) CONSULTANT	
Signature	Date 7/26/2010	
Mailing Address CAVELL, MERTZ & ASSOCIATES, INC. 7839 ASHTON AVENUE		
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Telephone Number (include area code) 7033929090	E-Mail Address (if available) BCLINTON@CAVELLMERTZ.COM	

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).

SECTION III - Engineering (Digital)

TECHNICAL SPECIFICATIONS

Ensure that the specifications below are accurate. All items must be completed. The response "on file" is not acceptable.

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.

TECH BOX

1.	Channel Number: 38
2.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 36 Minutes 51 Seconds 39 <input checked="" type="radio"/> North <input type="radio"/> South Longitude: Degrees 76 Minutes 21 Seconds 13 <input checked="" type="radio"/> West <input type="radio"/> East
3.	Antenna Structure Registration Number: 1047304 <input type="checkbox"/> Not Applicable [Exhibit 8] <input type="checkbox"/> Notification filed with FAA
4.	Antenna Location Site Elevation Above Mean Sea Level: 3.0 meters
5.	Overall Tower Height Above Ground Level: 152.1 meters
6.	Height of Radiation Center Above Ground Level: 110.9 meters
7.	Maximum Effective Radiated Power (ERP): 15 kW
8.	Transmitter Output Power: 0.97 kW
9.	<p>a. Transmitting Antenna: Before selecting Directional "Off-the-Shelf", refer to "Search for Antenna Information" under CDBS Public Access (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.</p> <p><input checked="" type="radio"/> Nondirectional <input type="radio"/> Directional "Off-the-shelf" <input type="radio"/> Directional composite</p> <p>Manufacturer ERI Model ALP24L1-HSO-38</p> <p>b. Electrical Beam Tilt: 0.25 degrees <input type="checkbox"/> Not Applicable</p> <p>c. Directional Antenna Relative Field Values: <input checked="" type="checkbox"/> N/A (Nondirectional or Directional "Off-the-shelf")</p>

Rotation (Degrees): <input type="checkbox"/> No Rotation											
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											

Relative Field Polar Plot

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.	
10.	Out-of-channel Emission Mask: <input type="radio"/> Simple <input checked="" type="radio"/> Stringent

CERTIFICATION

11.	Interference. The proposed facility complies with all of the following applicable rule sections. 47.C.F.R Sections 73.6016, 73.6017, 73.6018, 73.6019, 73.6020, 73.6027 and 74.794(b).	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 9]
12.	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. 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.	<input checked="" type="radio"/> Yes <input type="radio"/> No See Explanation in [Exhibit 10]
13.	Channels 52-59. 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.	

PREPARERS CERTIFICATION ON PAGE 3 MUST BE COMPLETED AND SIGNED.

Exhibits

Exhibit 9

Description: EXHIBIT 9 - STATEMENT A

EXHIBIT 9 - STATEMENT A - NATURE OF THE PROPOSAL AND ALLOCATION CONSIDERATIONS

Attachment 9

Description
EXHIBIT 9 - STATEMENT A

Exhibit 10**Description:** EXHIBIT 10 - STATEMENT B

EXHIBIT 10 - STATEMENT B - ENVIRONMENTAL CONSIDERATIONS (WITH TABLE OF CONTENTS AND COPY OF FORM 301-CA, SECTION III - ENGINEERING)

Attachment 10

Description
EXHIBIT 10 - STATEMENT B

Exhibit 10 - Statement B
ENVIRONMENTAL CONSIDERATIONS
prepared for
The Union Mission
WJGN-CA Chesapeake, Virginia
Facility ID 66549
Ch. 38 (Digital Displacement) 15 kW

Introduction

The instant proposal is not believed to have a significant environmental impact as defined under Section 1.1306 of the Commission's Rules. Consequently, preparation of an Environmental Assessment is not required.

The Union Mission ("Mission") herein proposes to construct a low power digital television translator station on Channel 38 as a digital displacement facility to WJGN-CA, Channel 5, Chesapeake, Virginia. The transmitting antenna will be side-mounted on the existing antenna support structure, presently authorized for the analog WJGN-CA facility under BLTVA-20010926ABL.

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 Commission's Rules. No increase in overall structure height is proposed, thus no change in structure lighting or marking is anticipated. Thus, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's Rules.

Human Exposure to Radiofrequency Electromagnetic Field

The proposed operation was evaluated for human exposure to radiofrequency electromagnetic field using the procedures outlined in the Commission's OET Bulletin No. 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with the limits specified in §1.1310 if it satisfies the exposure criteria set forth in OET 65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

Exhibit 10 - Statement B
ENVIRONMENTAL CONSIDERATIONS
(page 2 of 3)

The proposed WJGN-CA digital Channel 38 antenna will be situated such that its center of radiation is 110.9 meters above ground. An ERP of 15 kilowatts, horizontally polarized, will be employed. According to elevation pattern data provided by the antenna manufacturer, the WJGN-CA Channel 38 antenna has a maximum relative field of 30 percent from 15 to 90 degrees below the horizontal plane (i.e., below the antenna). Thus, a value of 30 percent relative field is used for this calculation. The “uncontrolled/general population” limit specified in §1.1310 for Channel 38 (center frequency 617 MHz) is 411.3 $\mu\text{W}/\text{cm}^2$.

OET 65’s formula for television transmitting antennas is based on the NTSC transmission standards, where the average power is normally much less than the peak power. For DTV facilities, the peak-to-average ratio is different than the NTSC ratio. The DTV ERP figure herein refers to the *average* power level. The formula used for calculating DTV signal density in this analysis is essentially the same as equation (10) in OET 65.

$$S = [(33.4098) (F)^2 (ERP)] / D^2$$

Where:

<i>S</i>	=	power density in microwatts/cm ²
<i>ERP</i>	=	total (average) ERP in Watts
<i>F</i>	=	relative field factor
<i>D</i>	=	distance in meters

Using this formula, the proposed facility would contribute a power density of 3.8 $\mu\text{W}/\text{cm}^2$ at two meters above ground level near antenna support structure, or 0.92 percent of the general population/uncontrolled limit. At ground level locations away from the base of the tower, the calculated RF power density is even lower, due to the increasing distance from the transmitting antenna.

§1.1307(b)(3) states that facilities contributing less than five percent of the exposure limit at locations with multiple transmitters are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of any

Exhibit 10 - Statement B
ENVIRONMENTAL CONSIDERATIONS
(page 3 of 3)

other facilities near this site may be considered independently from this proposal. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

Safety of Tower Workers and the General Public

As demonstrated herein, excessive levels of RF energy attributable to the instant proposal will not be caused at publicly accessible areas at ground level near the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower access will continue to be restricted and controlled through the use of a locked fence. Additionally, appropriate RF exposure warning signs will continue to be posted.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure will not occur in areas at ground level. A site exposure policy will continue to be employed protecting maintenance workers from excessive exposure when work must be performed on the tower or in areas where high RF levels may be present. Such protective measures may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines would otherwise be exceeded. On-site RF exposure measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with any pertinent stations.

Conclusion

Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under Section 1.1306 of the Rules; hence preparation of an Environmental Assessment is not required.