

ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Digital Television Station Construction Permit

prepared for

University Of North Carolina

WUND-TV Edenton, NC

Facility ID 69292

Ch. 29 657 kW 490 m

University Of North Carolina (“UNC”) is the licensee of digital television station WUND-TV, Channel 20, Facility ID 69292, Edenton, NC. *UNC* herein proposes construction of the WUND-TV post-auction facility on Channel 29. Reassignment of WUND-TV from Channel 20 to Channel 29 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice (“CCRPN”, DA 17-317, released April 13, 2017)*.

The proposed Channel 29 operation will employ a new antenna system to be top-mounted on the WUND-TV tower in lieu of the existing Channel 20 antenna. *UNC* proposes to operate WUND-TV with an effective radiated power (“ERP”) of 657 kW at 490 meters antenna height above average terrain (“HAAT”). The existing tower structure corresponds to FCC Antenna Structure Registration number 1063239. No change to the overall structure height will result.

The proposed antenna is an elliptically polarized nondirectional Dielectric model TFU-30GTH/VP-R O4 (42.9 percent vertical polarization). The horizontally polarized ERP is 657 kW and the vertically polarized ERP is 282 kW.

A map is supplied as Figure 1 which depicts the standard predicted coverage contours. This map includes the location of Edenton, WUND-TV’s principal community. As demonstrated thereon, the proposed facility complies with §73.625(a)(1) as the entire principal community will be encompassed by the 48 dB μ contour.

The proposed noise limited service contour (“NLSC”) does not extend beyond that of the *CCRPN* parameters of 664 kW ERP and 488 meters HAAT. Therefore, interference analysis to other television facilities is not required.

The proposed WUND-TV facility’s terrain-limited population provides a 100.0 percent match of the *CCRPN* baseline facility, as detailed in the following table.

Terrain Limited Population - Match of Reassignment

| Population Summary (2010 Census) OET Bulletin 69: TVStudy | Reassignment Parameters | Proposed |
|--|----------------------------|---------------|
| Within Noise Limited Contour | 1,506,425 | 1,506,111 |
| Not affected by terrain losses | 1,506,425 | 1,506,111 |
| Match of Reassignment | --- | 100.0% |

The proposed 657 kW ERP exceeds the maximum allowed for the proposed antenna HAAT of 490 meters permitted by §73.622(f)(8)(i). The proposed 657 kW / 490 m facility places the NLSC at the same location as the *CCRPN* facility parameters of 664 kW / 488 m. The proposed antenna’s radiation center height is increased slightly from the reassignment height, and the ERP is reduced commensurately to maintain the same NLSC location. Therefore, the ERP restriction is not applicable to the proposed WUND-TV facility since the proposal does not expand the NLSC beyond the *CCRPN*.

The nearest FCC monitoring station is 365 km distant at Laurel, MD. 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). There are no authorized AM stations within 3 kilometers of the site. The site location is beyond the border areas requiring international coordination.

Human Exposure to Radiofrequency Electromagnetic Field

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC’s OET Bulletin Number 65. Based on OET-65 equation (10), and considering 10 percent antenna relative field in downward elevations (pattern data shows less than 10 percent relative field at angles 10 to 90 degrees below the antenna), the calculated

signal density near the tower at two meters above ground level attributable to the proposed facility is $1.3 \mu\text{W}/\text{cm}^2$, which is 0.4 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.

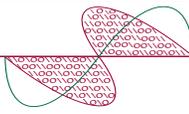
The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power 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. No increase in structure height is proposed.

List of Attachments

Figure 1 Proposed Coverage Contours
Form 2100 Saved Version of Engineering Sections from FCC Form at Time of Upload

Chesapeake RF Consultants, LLC

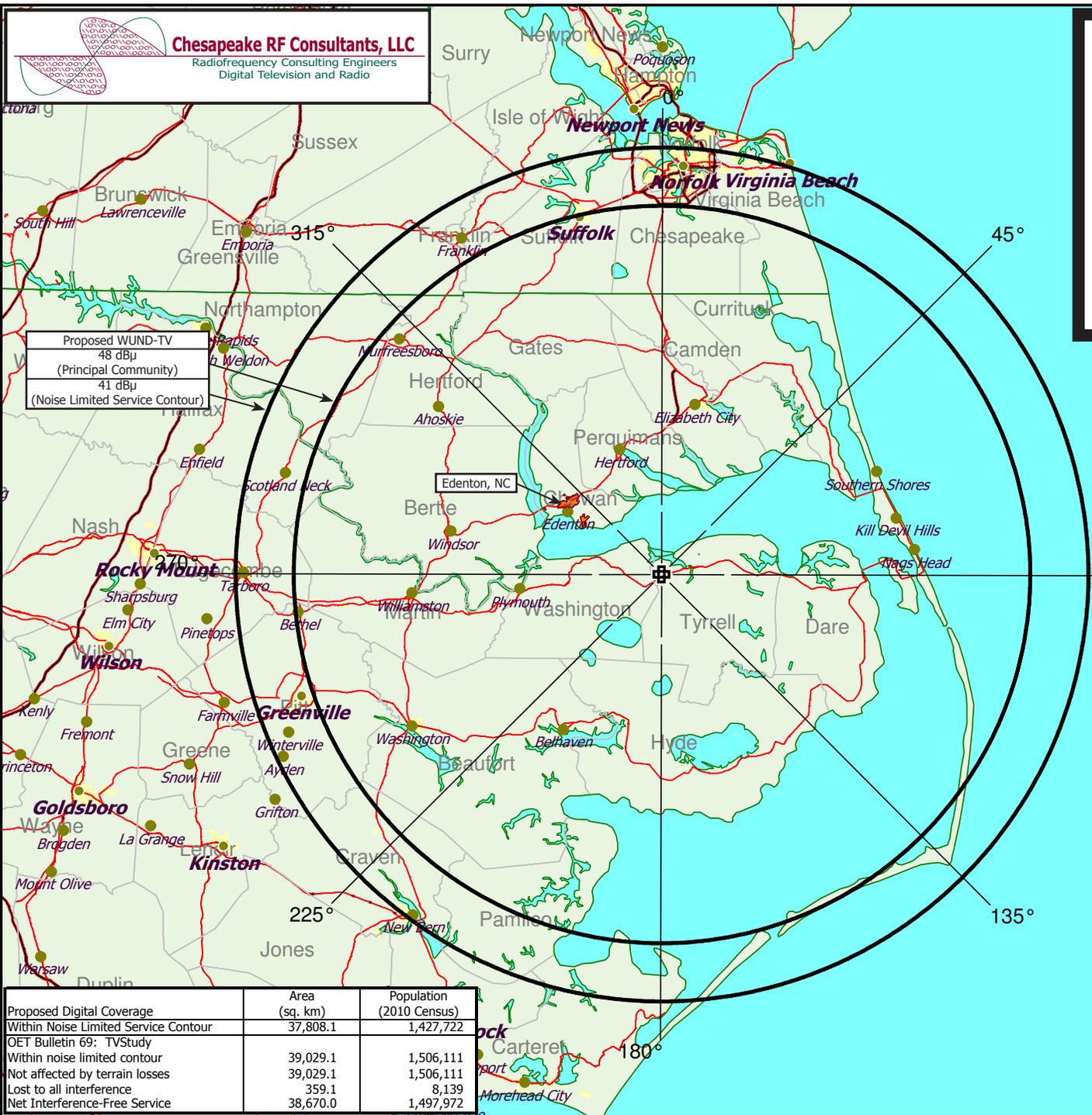
Joseph M. Davis, P.E. June 15, 2017
207 Old Dominion Road Yorktown, VA 23692 703-650-9600



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

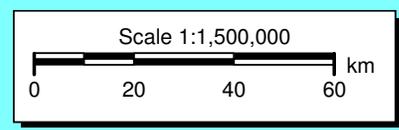
Figure 1
Proposed Coverage Contours
WUND-TV Edenton, NC
Facility ID 69292
Ch. 29 657 kW 490 m

prepared for
University Of North Carolina
 June, 2017



Proposed WUND-TV
 48 dBu
 (Principal Community)
 41 dBu
 (Noise Limited Service Contour)

| Proposed Digital Coverage | Area (sq. km) | Population (2010 Census) |
|--|---------------|--------------------------|
| Within Noise Limited Service Contour | 37,808.1 | 1,427,722 |
| OET Bulletin 69: TVStudy Within noise limited contour | 39,029.1 | 1,506,111 |
| Not affected by terrain losses | 39,029.1 | 1,506,111 |
| Lost to all interference | 359.1 | 8,139 |
| Net Interference-Free Service | 38,670.0 | 1,497,972 |



Channel and Facility Information

| Section | Question | Response |
|--------------------------------------|---------------|---------------------------|
| Proposed Community of License | Facility ID | 69292 |
| | State | North Carolina |
| | City | EDENTON |
| | DTV Channel | 29 |
| Facility Type | Facility Type | Noncommercial Educational |
| | Station Type | Main |
| Zone | Zone | 2 |

Antenna Location Data

| Section | Question | Response |
|---------------------------------------|---|---------------------------------------|
| Antenna Structure Registration | Do you have an FCC Antenna Structure Registration (ASR) Number? | Yes |
| | ASR Number | 1063239 |
| Coordinates (NAD83) | Latitude | 35° 54' 01.0" N+ |
| | Longitude | 076° 20' 44.0" W- |
| | Structure Type | TOWER-A free standing or guyed struct |
| | Overall Structure Height | 499.9 meters |
| | Support Structure Height | 479.8 meters |
| | Ground Elevation (AMSL) | 1.8 meters |
| Antenna Data | Height of Radiation Center Above Ground Level | 489.4 meters |
| | Height of Radiation Center Above Average Terrain | 490.4 meters |
| | Height of Radiation Center Above Mean Sea Level | 491.2 meters |
| | Effective Radiated Power | 657 kW |

**Antenna
Technical Data**

| Section | Question | Response |
|---------------------------------------|---|-------------------|
| Antenna Type | Antenna Type | Non-Directional |
| | Do you have an Antenna ID? | |
| | Antenna ID | |
| Antenna Manufacturer and Model | Manufacturer: | DIE |
| | Model | TFU-30GTH/VP-R O4 |
| | Rotation | |
| | Electrical Beam Tilt | 0.75 |
| | Mechanical Beam Tilt | Not Applicable |
| | toward azimuth | |
| | Polarization | Elliptical |
| DTV and DTS: Elevation Pattern | Does the proposed antenna propose elevation radiation patterns that vary with azimuth for reasons other than the use of mechanical beam tilt? | No |
| | Uploaded file for elevation antenna (or radiation) pattern data | |

**Construction
Permit
Certifications**

| Section | Question | Response |
|---|---|------------|
| <p>Post-Incentive Auction Expedited Processing</p> | <p>It will operate on the DTV channel for this station as established in the post-incentive auction channel reassignment public notice.</p> | <p>Yes</p> |
| | <p>It will operate post-incentive auction facilities that do not expand the noise-limited service contour in any direction beyond that established by the post-incentive auction channel reassignment public notice.</p> | <p>Yes</p> |
| | <p>It will operate post-incentive auction facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the post-incentive auction channel reassignment public notice.</p> | <p>Yes</p> |
| | <p>The antenna structure to be used by this facility has been registered by the Commission and will not require re-registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely affect 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.</p> | <p>Yes</p> |
| <p>Environmental Effect</p> | <p>Would a Commission grant of Authorization for this location be an action which may have a significant environmental effect? (See Section 1.1306 of 47 C.F.R.)</p> | <p>No</p> |
| <p>Broadcast Facility</p> | <p>The proposed facility complies with the applicable engineering standards and assignment requirements of 47 C.F.R. Sections 73.616, 73.622(i), 73.623(e), 73.625, 73.1030, and 73.1125.</p> | <p>Yes</p> |