

TECHNICAL EXHIBIT  
APPLICATION FOR FM CONSTRUCTION PERMIT  
FM TRANSLATOR W247AD  
ROANOKE, VIRGINIA  
CH 247D 0.099 KW

Technical Narrative

This Technical Exhibit was prepared in support of an application for construction permit for a FM translator station W247AD at Vinton, Virginia. W247AD is currently licensed to operate with an effective radiated power (ERP) of 10 watts (BLFT-20050711ABZ). This application proposes to change the community of license to Roanoke, Virginia increase the effective radiated power to 99 watts, relocate its transmitter site to atop *Brushy Mountain* and diplex with FM translator W297BC. This application is classified as a minor change as there will be contour overlap with the present and proposed 60 dBu contours. The translator will become a fill-in translator for WXLK(FM) at Roanoke, Virginia.

Tower Registration

The proposed antenna supporting structure is located on a registered structure, ASR number 1238538.

### Predicted Coverage Contour

The predicted 60 dBu coverage contour was calculated in accordance with Section 73.313 of the FCC Rules. The average terrain elevations from 3 to 16 km from the proposed site were computed using the N.G.D.C. 30-second terrain database. The distances to the predicted 60 dBu coverage contour for the proposal was determined using the average elevations of radials spaced every 30-degrees of azimuth. The antenna radiation center height above average terrain and the ERP in each radial direction were used in conjunction with the propagation prediction curves of Section 73.333 to determine the distances to the contour. Figure 3 is a map showing the predicted 60 dBu coverage contour of the proposed translator facility.

The presently licensed 60 dBu contour is also shown on the map to indicate this is a minor change application.

### Allocation Considerations

Toward all other licensed and authorized stations, there is no prohibited contour overlap predicted except toward: W245BG on Channel 245D (96.9 MHz) at Cave Spring, Virginia and WVBB(FM) on Channel 249A (97.7 MHz) at Elliston-Lafayette, Virginia.

The protected 60 dBu contours of W245BG overlap the proposed W247AD 100 dBu interfering contour. However, no actual interference is predicted to occur to any populated area as required by Section 74.1204(d) of the Commission's Rules. It is noted that the herein proposed W247AD will be co-located with W245BG.

The proposed W247AD effective radiated power of 99 watts is 10 dB above the W245BG non-directional effective radiated power of 10 watts. Therefore, it is obvious that the Section 74.1204(d) requirement of the lack of affected population due to

this contour overlap will occur, as W247AD will not produce a field where the -40 dB desired-to-undesired ratio is exceeded.

The protected 60 dBu contour of WVBB(FM) does overlap the proposed W247AD 100 dBu interfering contour. However, using the ratio method, no actual interference is predicted to WVBB(FM). The FCC propagation curves predict that WVBB(FM) has a field strength of 74 dBu at the proposed transmitter site. Applying a 40 dB desired-to-undesired ratio, the proposed facility does not cause interference to population either within the 114 dBu interfering contour.

As shown by the topographic map provided in Figure 1, it can be calculated that the nearest public access point is 0.5 mile (800 meters) away from the proposed transmitter site. The “worst-case” 114 dBu interfering contour is only predicted to extend 140 meters. Therefore, as there is no public population within the “worst-case” interference area to WVBB(FM) and therefore is permitted by Section 74.1204(d) of the Commission’s Rules.

#### Radio Frequency Exposure Analysis

The proposal is categorically excluded from environmental processing, as an existing tower site is to be employed, and the proposal complies with the FCC Rules concerning human exposure to radio frequency (RF) energy. The proposal will not exceed 2 percent of the RF exposure limit for general population/uncontrolled environments for the frequency proposed. The calculation of RF energy at ground level was made under the procedures of OET Bulletin No. 65.<sup>1</sup> The formula employed is as follows:

$$S = \frac{(33.4)F^2P}{R^2}$$

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<sup>1</sup> Federal Communications Commission OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields (Edition 97-01, August 1997).

Where,  $S$  = power density in  $\mu\text{W}/\text{cm}^2$ ,  $F$  = relative field factor at the angle to the calculation point,  $P$  = the total effective radiated power relative to a dipole in watts, and  $R$  = distance from the antenna radiation center to the calculation point in meters. Based on the conservative assumption of a relative field factor of 1.0 with a total effective radiated power of 99 watts, and an antenna radiation center height above ground of 24 meters, the calculated power density will not exceed  $5 \mu\text{W}/\text{cm}^2$ . Therefore, the calculated RF exposure at ground level will not exceed 5 percent of the limit of  $200 \mu\text{W}/\text{cm}^2$  for an uncontrolled electromagnetic environment. As the predicted exposure contribution is less than five percent, consideration of other emitters is not necessary.

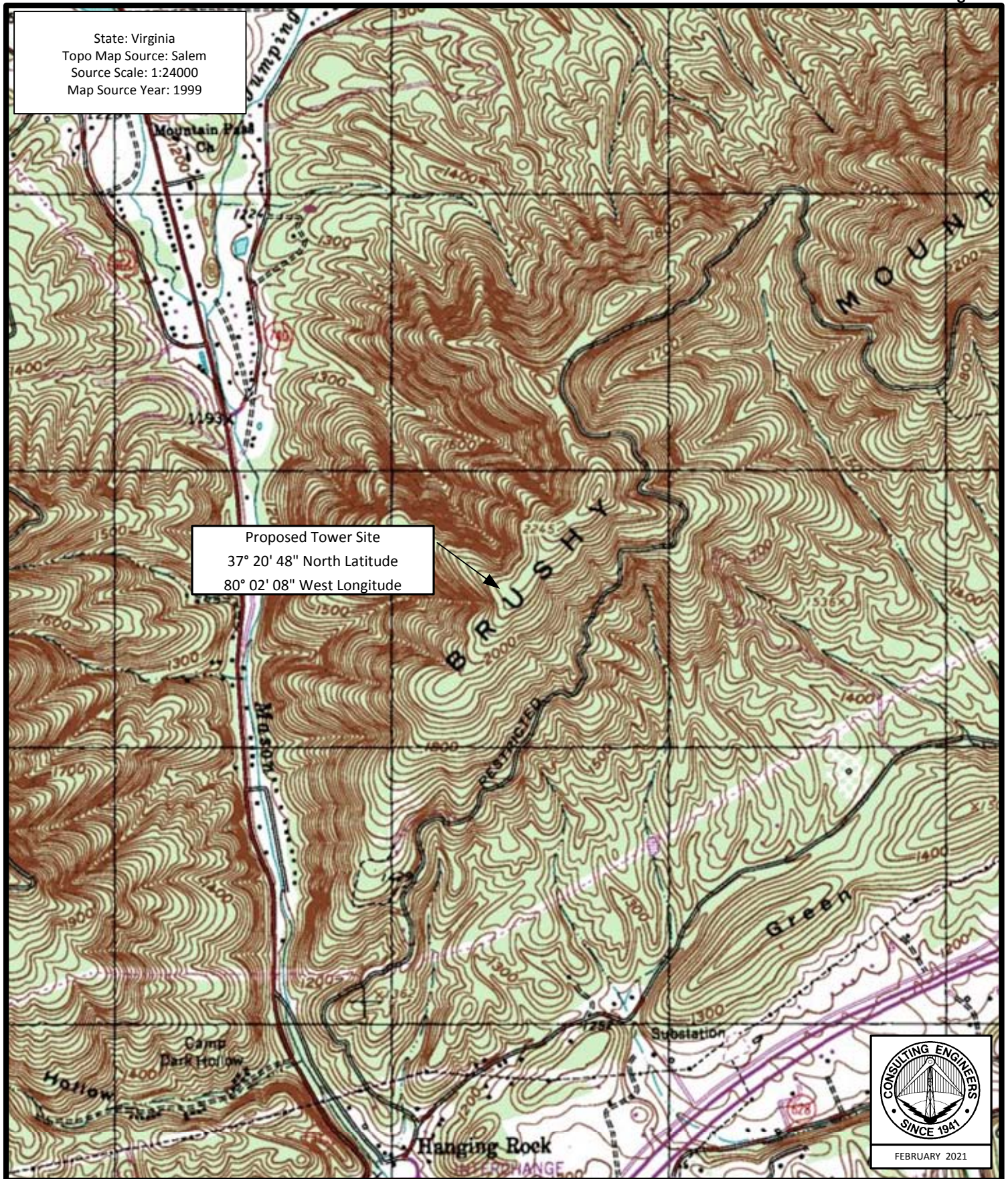
The transmitter site shall be restricted from access. In the event that personnel are required to climb the structure, the proposed FM translator transmissions shall be reduced or terminated as necessary to prevent RF exposure above the FCC recommended limits.

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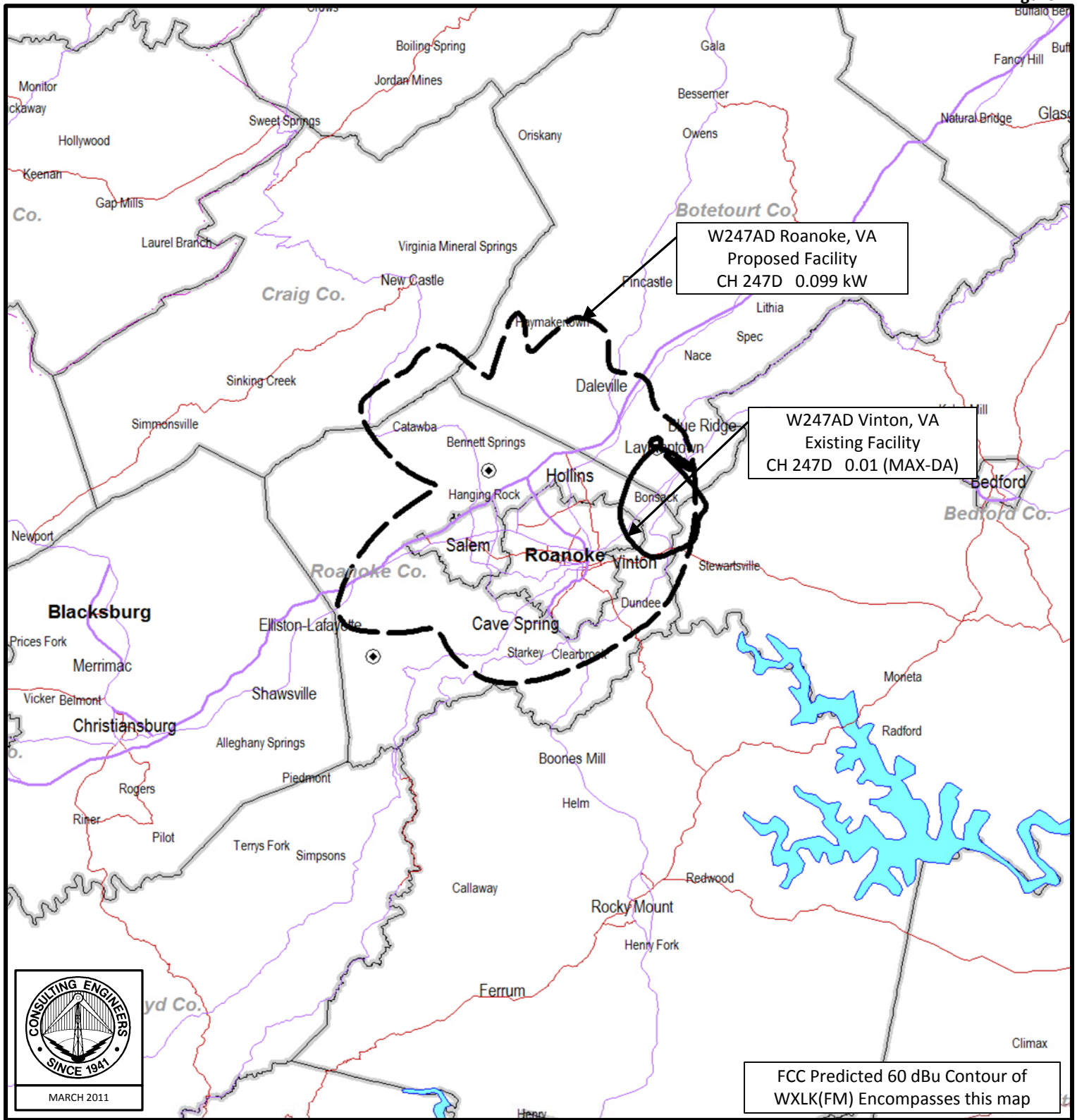
## TRANSMITTER SITE MAP AND LOCATION OF NEAREST KNOWN PUBLIC LOCATION TO TOWER

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du Treil, Lundin & Rackley, Inc Sarasota, Florida



**Figure 2**



## FCC PREDICTED COVERAGE CONTOURS

FM TRANSLATOR W247AD

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du Treil, Lundin & Rackley, Inc Sarasota, Florida