

**Exhibit 12**  
**Comprehensive Engineering Statement**

prepared for

**WHVN, Inc.**

W228EJ Rock Hill, South Carolina

Facility ID 200549

Channel 268D 0.25 kW 65 meters AGL

WHVN, Inc. (“*WHVN*”), has been granted a Construction Permit for W228EJ (file no. BNPFT-20180612AAY) on Channel 228D utilizing a directional antenna. W228EJ is a fill-in translator for standard broadcast station WAVO(AM), 1150 kHz, Rock Hill, SC. A License to Cover application has been filed (file no. BLFT-20190730AAU), and during Program Testing, interference complaints began to come in. Based on the complaints and showings herein, *WHVN* seeks to propose minor modification to change to Channel 268 in remediation<sup>1</sup> of the interference. In particular, *WHVN* proposes to use the same registered tower, ASRN 1047008 with coordinates of 34° 56’ 54.5”N, 80° 59’ 57.7”W (NAD 27). The proposed coordinates represent a minor correction to better correspond with the ASR. The proposed antenna will be directional, circularly polarized and mounted at 65 meters AGL. An ERP of 250 Watts is being specified.

**Nature of the Proposal**

The antenna system for the proposed translator is a directional antenna, which will be side-mounted on an existing antenna support structure. No change in structure overall height is necessary to carry out this proposal. Since no change to the structure’s overall height is proposed, no change to structure marking/lighting requirements will result.

The proposed directional horizontal plane relative field pattern is an envelope pattern derived to provide protection to adjacent channel facilities, and is tabulated in **FCC Form 349, Section III-A, Item 10**. The attached **Figure 1** depicts a plot of the proposed directional pattern, properly oriented to True North. **Figure 2** supplies a plot of the vertical (elevation) plane pattern.

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<sup>1</sup> §74.1233(a)(1)(i)(A)(2) states that channel changes to other than first, second, third adjacent, or IF relationship channels may be proposed to remediate based upon showing of interference. The Report and Order that instituted the Rule suggested that the interference showing can be a simple engineering statement of interference. See Report & Order, “*Amendment of Part 74 of the Commission’s Rules Regarding FM Translator Interference*”, FCC 19-40, MB Docket No. 18-119, adopted May 9, 2019, paragraph 8.

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### Allocation Considerations

In support of demonstrating existing interference, **Figure 3** demonstrates that the authorized translator's service area lies entirely within the interfering contour of co-channel WYFQ-FM (Ch 228C3, Wadesboro, NC). It is believed that this demonstrates the likelihood of interference as experienced by W228EJ. If additional demonstration of the likelihood of interference is needed, *WHVN* will provide the showing. The location of the 60 dB $\mu$  coverage contour of the proposed translator includes overlap with the original authorization, and lies within both the 2 mV/m and the 40 km (25-mile) radius of the licensed coordinates of WAVO(AM), as shown in the map provided as **Figure 3a**, thus complying with §74.1201(g).

The results of a study of nearby FM facilities on co-channel, adjacent-channel, and intermediate frequencies was conducted to identify which stations require further study to demonstrate compliance under §74.1204. The nearest co-channel facility is LPFM station WBAC-LP (Ch 268L1, Belmont, NC). As demonstrated in **Figure 4**, no prohibited contour overlap will occur with co-channel facilities. The closest first adjacent stations are W267BZ (Ch. 267D, Charlotte, NC) and WWDM (Ch. 267C, Sumter, SC) and require further study, as shown in **Figure 4**. The 54 dB $\mu$  F(50,10) contour of the proposed facility does not overlap the protected 60 dB $\mu$  F(50,50) contour of either first adjacent facility<sup>2</sup>.

Protection of the nearby second adjacent Channel 270C0 WBAV-FM is achieved pursuant to §74.1204(d) by demonstrating that the proposed translator's interfering contour does not reach populated areas. The proposed facility's Channel 268 antenna is located at the WBAV-FM 76 dB $\mu$  contour, as demonstrated in **Figure 4**. Thus, based on the -40 dB desired-to-undesired ratio specified in §74.1204(a)(3), the appropriate second-adjacent interfering signal level at this location is 116 dB $\mu$ . The proposed antenna will be configured as a 2-bay, 0.75 wavelength spaced antenna. Using the vertical (elevation) pattern for this antenna, calculations were performed to determine the signal strength from the proposal at two meters above ground level near the transmitter site. As shown in **Figure 5**, the signal strength for the proposed facility will not exceed 112 dB $\mu$  within 1,000 meters of the tower. Thus, the proposed translator's interfering signal will not exceed the

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<sup>2</sup> Further, studies were performed on co-channel and adjacent channel stations to their 45 dB $\mu$  contour based on the FCC's D/U contour method, and have determined that no new areas of interference will be created by the instant proposal.

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level of 116 dB $\mu$  that would be considered interference to surrounding population at ground level or nearby buildings. There are no IF relationship (53 or 54 channels removed) facilities within 30 km of the proposal. The proposed facility is co-located with its parent station, WAVO(AM) which is a non-directional facility. *WHVN* will coordinate with itself to take appropriate readings and to assure that the installation does not adversely impact WAVO. There are no other AM stations within 3.2 km of the proposed facility.

The proposed site is located more than 750 km from the Canadian and Mexican borders, well beyond the 320 km coordination distance required for translators specified in §74.1235(d). The nearest FCC monitoring station is 363.0 km distant at Powder Springs, GA and the facility is 286.7 km from the Green Bank Quiet Zone. These distances exceed the threshold minimum distance specified in §73.1030 that would suggest consideration.

It is therefore believed that the proposed facility satisfies all of the pertinent Commission Rules and Policies now in effect regarding allocation matters.

### **Environmental Considerations**

The proposed facility will operate with a circularly-polarized ERP of 250 Watts with a directional antenna at 65 meters AGL on the registered tower with ASRN 1047008. 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 FCC Rules. Because no change in structure height is proposed, no change in current structure marking and lighting requirements is anticipated. Therefore, 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 Radiation**

The proposed operation was evaluated for human exposure to radiofrequency energy 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 meets 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

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that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

The general population/uncontrolled maximum permitted exposure (“MPE”) limit specified in §1.1310 for the entire FM broadcast band is  $200 \mu\text{W}/\text{cm}^2$ . For the purpose of this study, “public access” will be considered at the base of the tower at a location two-meters above ground. Using the FCC’s FM Model program and a worst-case EPA Type 1 antenna it was determined that the proposed facility would contribute a worst-case RF power density of  $1.23 \mu\text{W}/\text{cm}^2$  at two meters above ground level near the antenna support structure, or 0.62 percent of the general population/uncontrolled limit.

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

### **Safety of Tower Workers and the General Public**

As demonstrated herein, excessive levels of RF energy will not be caused by the proposal 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 gate. According to information provided by the applicant, appropriate RF exposure warning signs are posted. In the event that maintenance or other workers gain access to the tower, power output of the translator will be decreased or shut off to protect workers.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure would not occur in areas at ground level. A site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed on the tower in areas where high RF levels may be present. Such protective measures may include, but

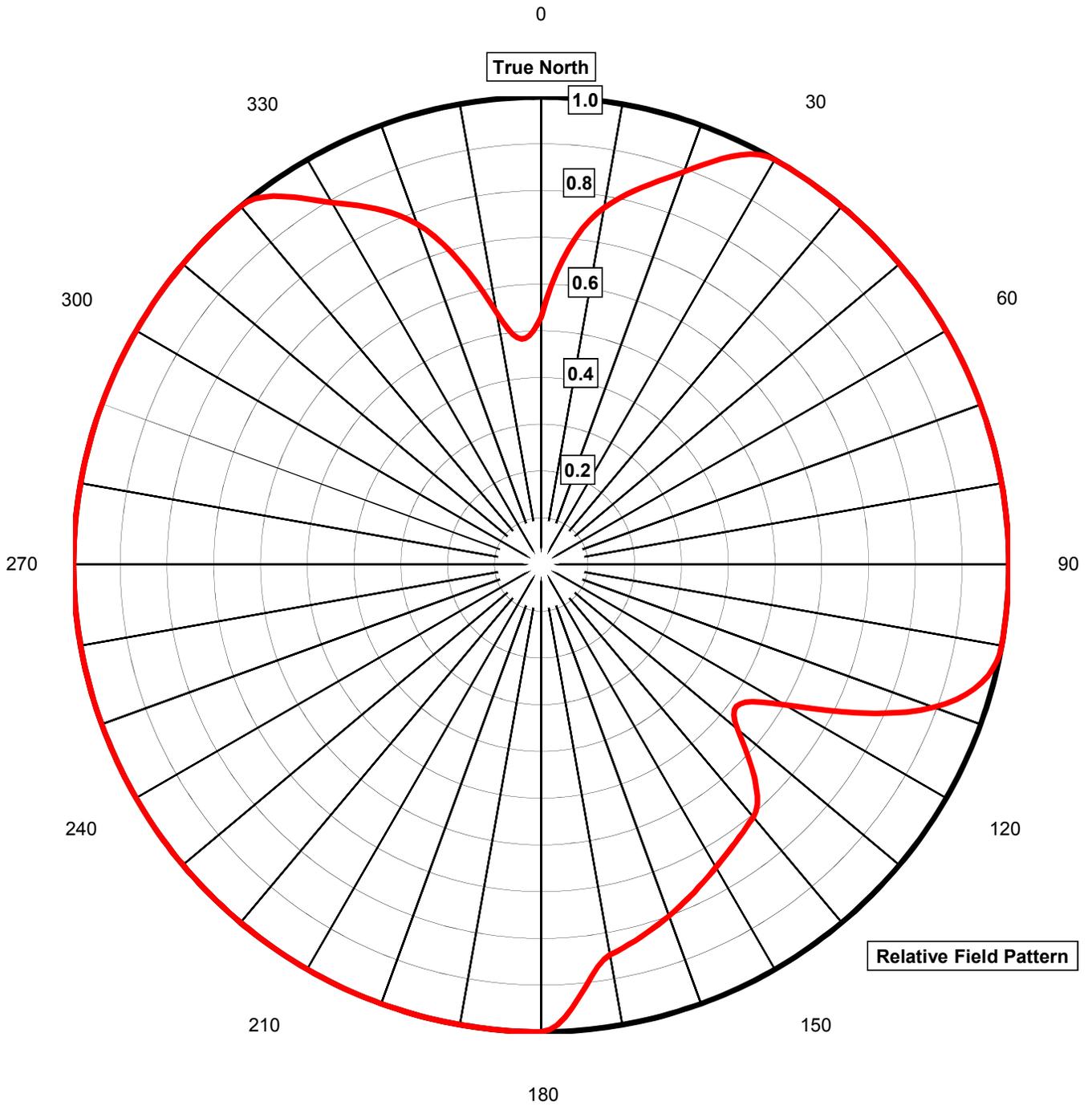
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will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines 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 all pertinent stations. Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under §1.1306 of the Rules, hence preparation of an Environmental Assessment is not required.

### **Conclusion**

It is therefore believed that the proposed facility satisfies all of the pertinent Commission Rules and Policies now in effect.



**EXHIBIT 12 - FIGURE 1**  
**ANTENNA HORIZONTAL PLANE**  
**RADIATION PATTERN**

prepared September 2019 for

**WHVN, Inc.**

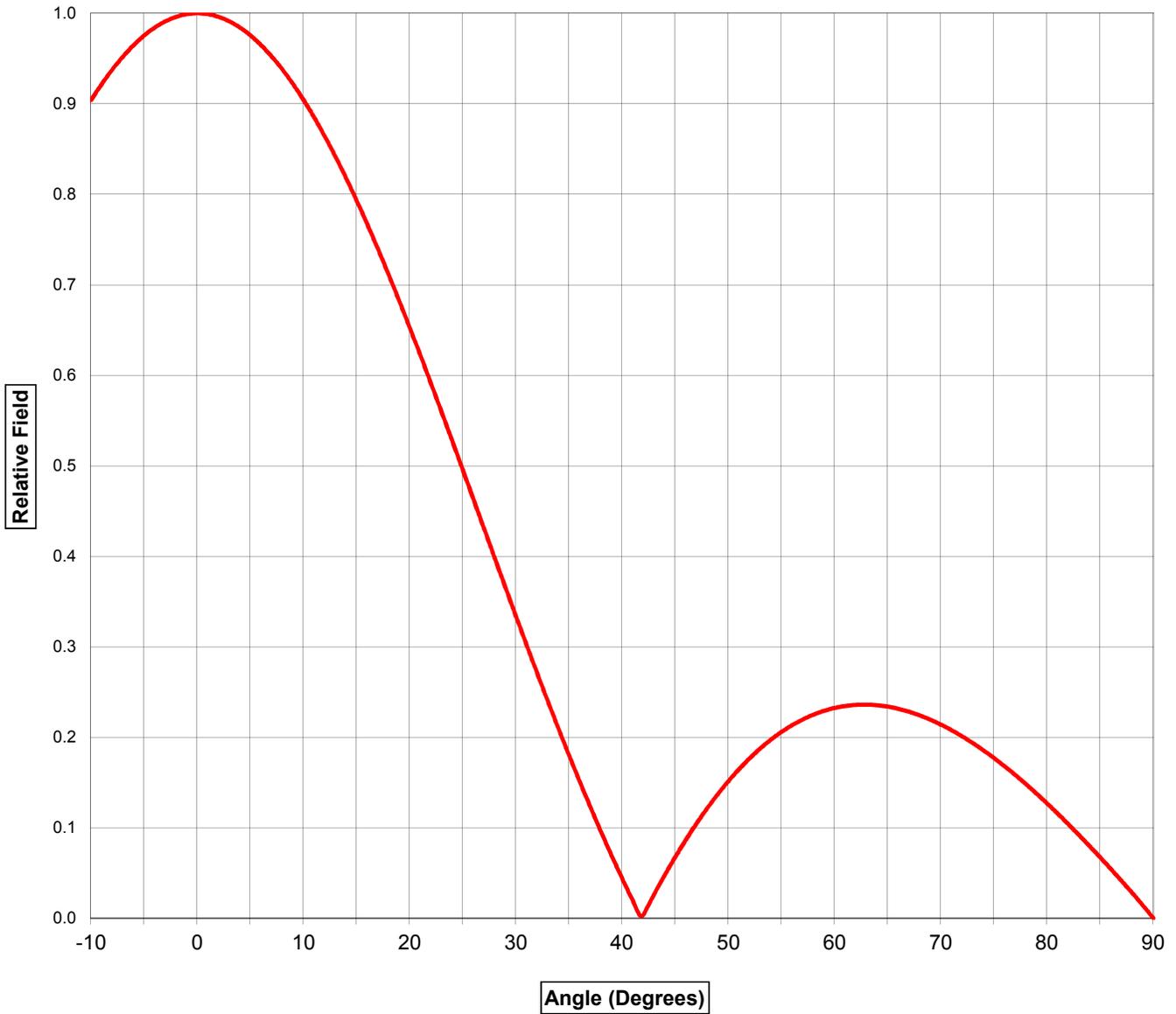
W228EJ Rock Hill, South Carolina

Facility Id 200549

Ch. 228D 0.25 kW

**Cavell, Mertz & Associates, Inc.**  
 Manassas, Virginia

**Relative Field Pattern**



**EXHIBIT 12 - FIGURE 2**  
**ANTENNA VERTICAL (ELEVATION)**  
**PLANE RADIATION PATTERN**

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Manassas, Virginia

**EXHIBIT 12 - FIGURE 3  
EXISTING INTERFERENCE**

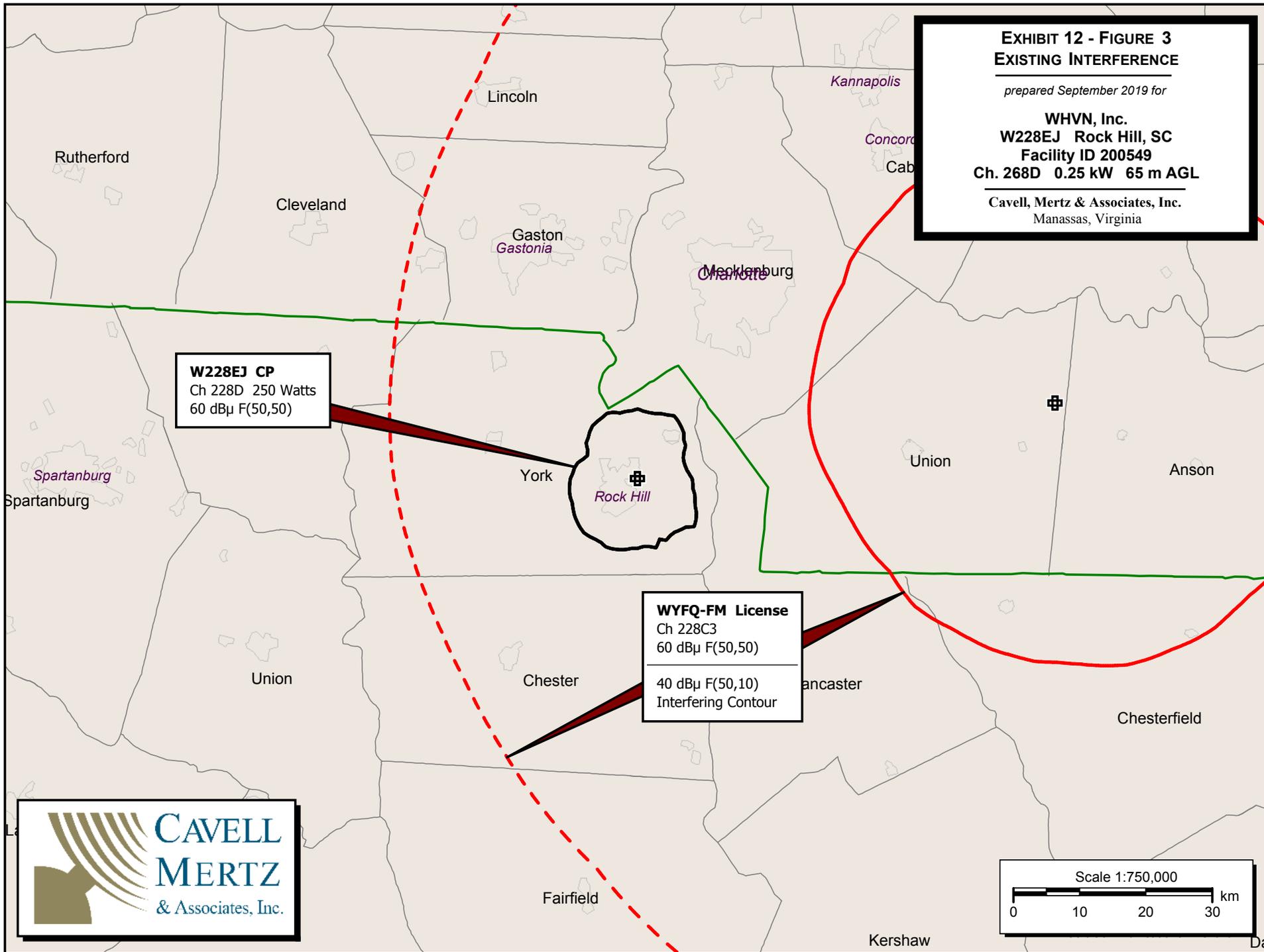
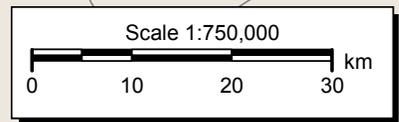
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**W228EJ CP**  
Ch 228D 250 Watts  
60 dBμ F(50,50)

**WYFQ-FM License**  
Ch 228C3  
60 dBμ F(50,50)  
40 dBμ F(50,10)  
Interfering Contour

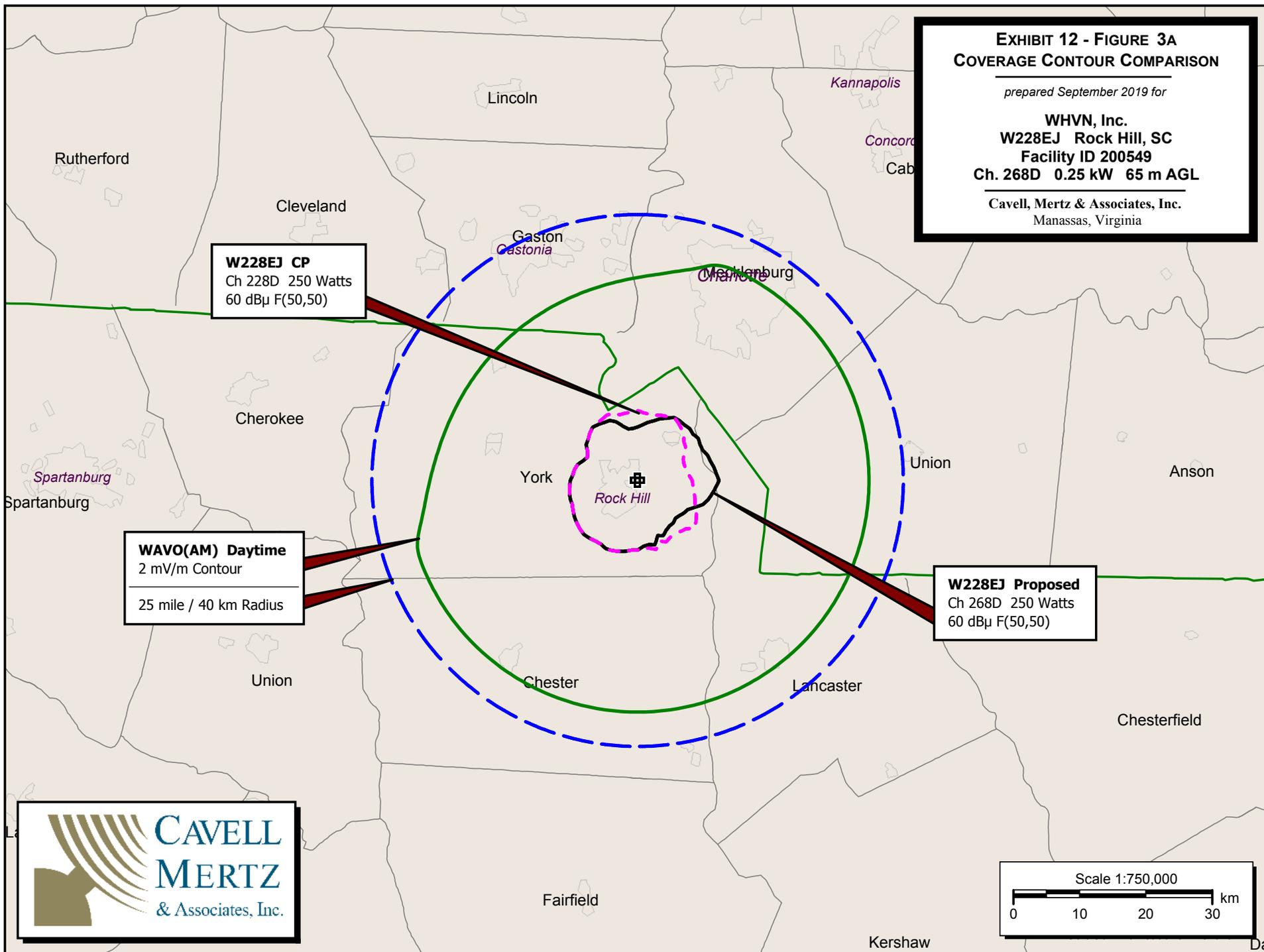


**EXHIBIT 12 - FIGURE 3A  
COVERAGE CONTOUR COMPARISON**

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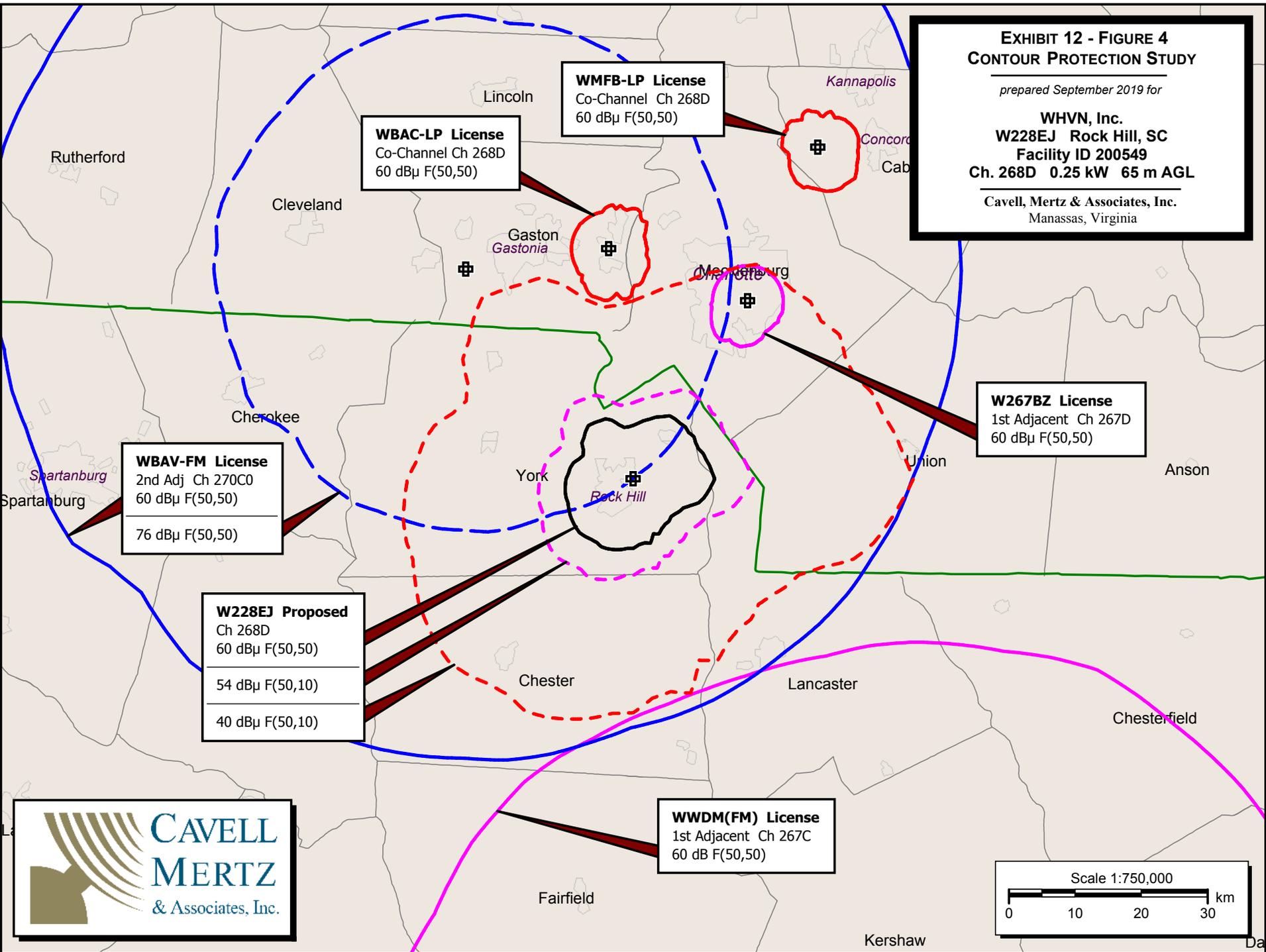


**EXHIBIT 12 - FIGURE 4  
CONTOUR PROTECTION STUDY**

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**WBAC-LP License**  
Co-Channel Ch 268D  
60 dBμ F(50,50)

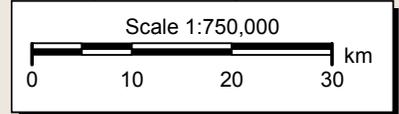
**WMFB-LP License**  
Co-Channel Ch 268D  
60 dBμ F(50,50)

**WBAV-FM License**  
2nd Adj Ch 270C0  
60 dBμ F(50,50)  
76 dBμ F(50,50)

**W228EJ Proposed**  
Ch 268D  
60 dBμ F(50,50)  
54 dBμ F(50,10)  
40 dBμ F(50,10)

**W267BZ License**  
1st Adjacent Ch 267D  
60 dBμ F(50,50)

**WWDM(FM) License**  
1st Adjacent Ch 267C  
60 dB F(50,50)



**EXHIBIT 12 - FIGURE 5**  
**POWER IN dB $\mu$  AT 2 METERS**

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