

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

prepared for

**Eagle Communications, Inc.**

NEW(FX) St. Joseph, Missouri

Facility ID 202774

Channel 298D 0.25 kW 148 meters AGL

Eagle Communications, Inc. (“*Eagle*”), seeks to propose a new cross-service FM translator for standard broadcast station KESJ(AM). The instant application is an amendment application as part of the Auction 100 filing window<sup>1</sup> to address an apparent MX condition with a separate *Eagle* proposal<sup>2</sup>. In particular, *Eagle* proposes to use the registered tower, ASRN 1006728 with coordinates of 39° 40’ 51.0”N, 94° 46’ 47.1”W (NAD 27). The proposed coordinates represent a minor correction of one second Latitude when compared to the Short Form application. The proposed antenna will be directional, circularly polarized and mounted at 148 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 (Kathrein/Scala array model 2xCA2-FM/CP/CV), which will be side-mounted on an existing antenna support structure (ASR number 1006728). 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, based on data provided by the antenna manufacturer, 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> Public Notice Settlement Period Announced for Cross-Service FM Translator Mutually Exclusive Applications for Auction 100, Released April 3, 2018, DA 18-332.

<sup>2</sup> Specifically, Attachment A to the Public Notice identifies Eagle’s applications for (1) a new FM translator at St. Joseph, MO on Channel 298 (Facility Id. No. 202774, FCC File NO. BNFPT-20180131AGD), and (2) a new FM translator at St. Joseph, MO on Channel 300 (Facility Id. No. 202776, FCC File No. BNFPT-20180131AFZ) as being mutually exclusive. Eagle is concurrently filing amendments to both of these applications to address the apparent mutual exclusivity.

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### Allocation Considerations

The location of the 60 dB $\mu$  coverage contour of the proposed translator lies within both the 2 mV/m and the 40 km (25-mile) radius of the licensed coordinates of KESJ(AM), as shown in the map provided as **Figure 3**, 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. First adjacent station KMJK(FM) and a co-located second adjacent NEW(FM) application (Ch. 300D, St. Joseph, MO, file number BNPFT-20180131AFZ) require attention. **Figure 4** demonstrates contour protection of first adjacent KMJK(FM) (Ch. 297C1, North Kansas City, MO). As shown, 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 KMJK(FM).

Protection of the co-located second adjacent Channel 300 NEW(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 298 antenna will be located on the same antenna support structure as the Channel 300 antenna. Both facilities propose operation with an antenna height difference of three meters. The Channel 300 signal strength at two meters above ground level at the base of the tower is calculated to be 117.43 dB $\mu$ , assuming a relative field of 1.000 in all directions<sup>3</sup>. 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 157.43 dB $\mu$ . The calculated radius distance to the proposed Channel 298 translator's 157.43 dB $\mu$  contour is 1.5 meters. The proposed facility's antenna will be mounted at 148 meters above ground level. Thus, the proposed translator's interfering signal does not exceed the level of 157.43 dB $\mu$  that would be considered interference to surrounding population at ground level or nearby buildings.

Similarly, calculations indicate that interference from Channel 300 into the instant proposal will not be a factor at ground level. As a directional facility, the minimum calculated signal level at 2 meters above ground level for the Channel 298 proposal is 98.68 dB $\mu$ . Thus, the -40 dB desired-to-undesired ratio specifies an interfering contour of 138.68 dB $\mu$  from the Channel 300 facility. The

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<sup>3</sup> Since both of the proposed antennas will have similar vertical (elevation) patterns, calculations of predicted interfering signal levels assume a worst-case relative field value of 1.000 in the vertical plane.

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Channel 300's 138.68 dB $\mu$  contour is predicted to reach 12.5 meters from the antenna, far short of the 145 meters above ground where the antenna is proposed to be located. Thus, the proposed translator's interfering signal does not exceed the level of 138.68 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 29 km of the proposal. There are no AM stations within 3.2 km of the proposed facility.

The proposed site is located more than 1,000 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 196.6 km distant at Grand Island, NE and the facility is 723.88 km from the Table Mountain 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 148 meters AGL on the registered tower with ASRN 1006728. 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  $0.47\mu\text{W}/\text{cm}^2$  at two meters above ground level near the antenna support structure, or 0.24 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

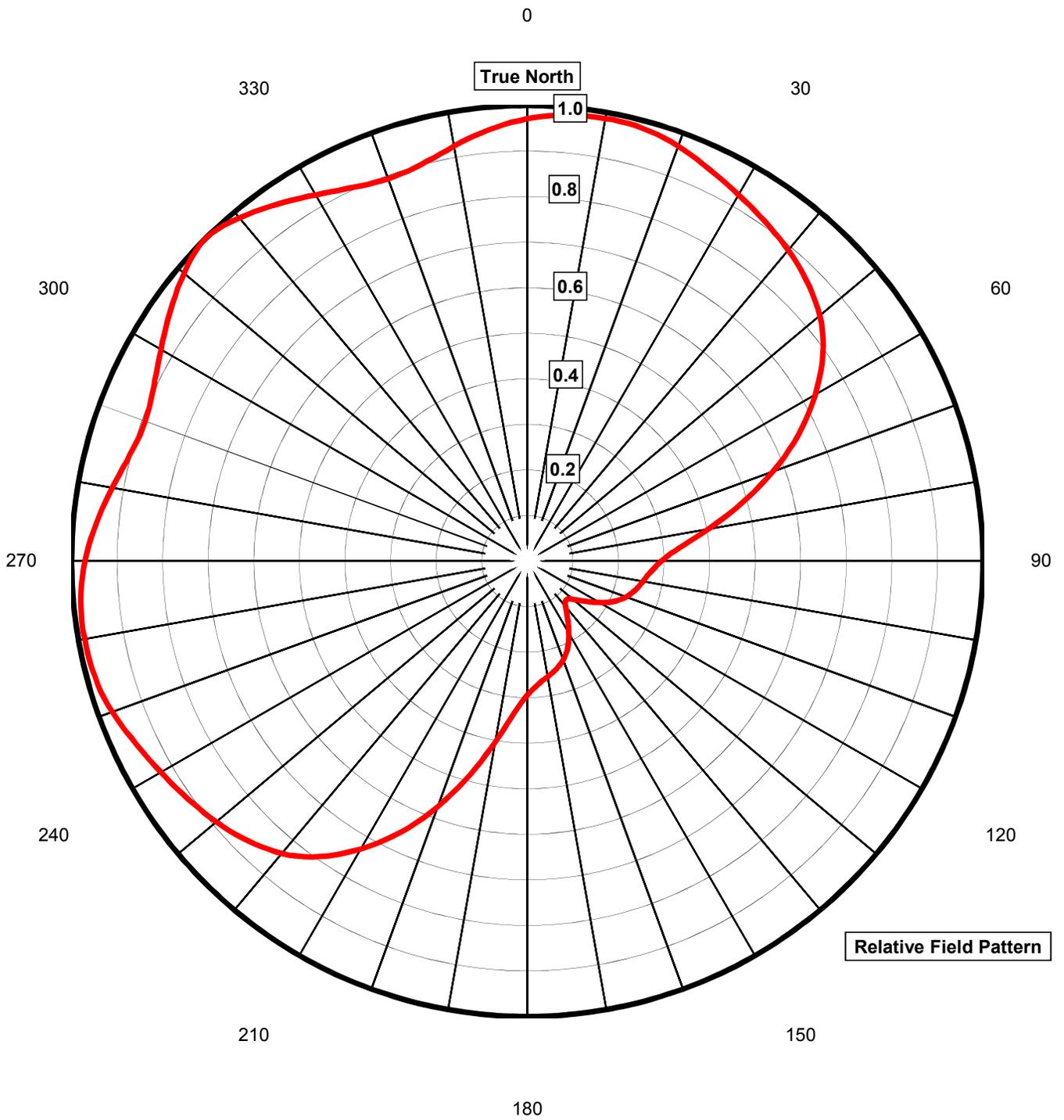
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will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines 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.

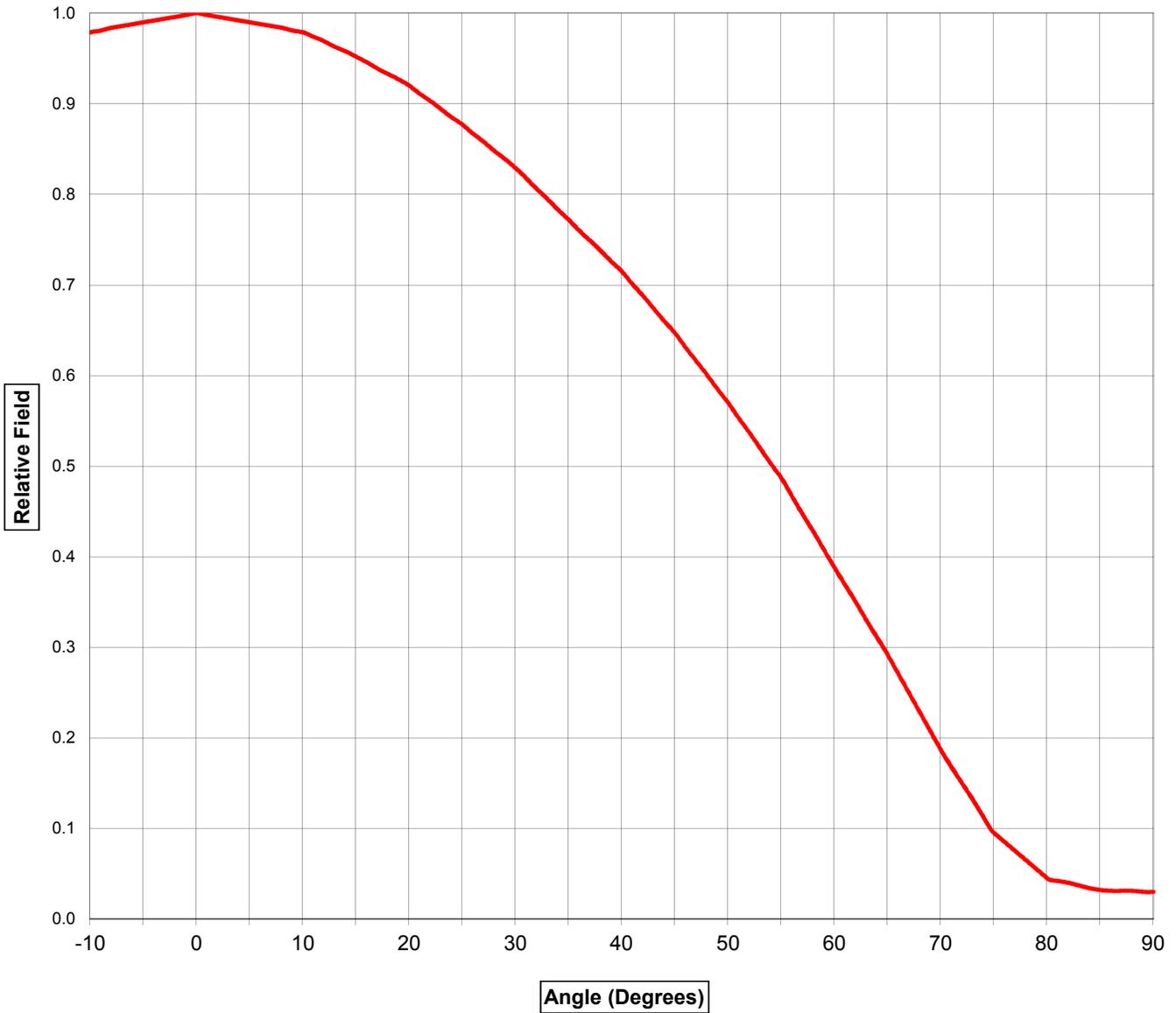


**EXHIBIT 12 - FIGURE 1**  
**ANTENNA HORIZONTAL PLANE**  
**RADIATION PATTERN**

prepared April 2018 for  
**Eagle Communications, Inc.**  
 NEW(FX) St. Joseph, Missouri  
 Facility Id 202774  
 Ch. 298D 0.25 kW 148 m AGL

**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  
COVERAGE CONTOUR COMPARISON**

*prepared April 2018 for*

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

**KESJ(AM) Daytime License**

2 mV/m Contour

40 km (25 mile) Radius

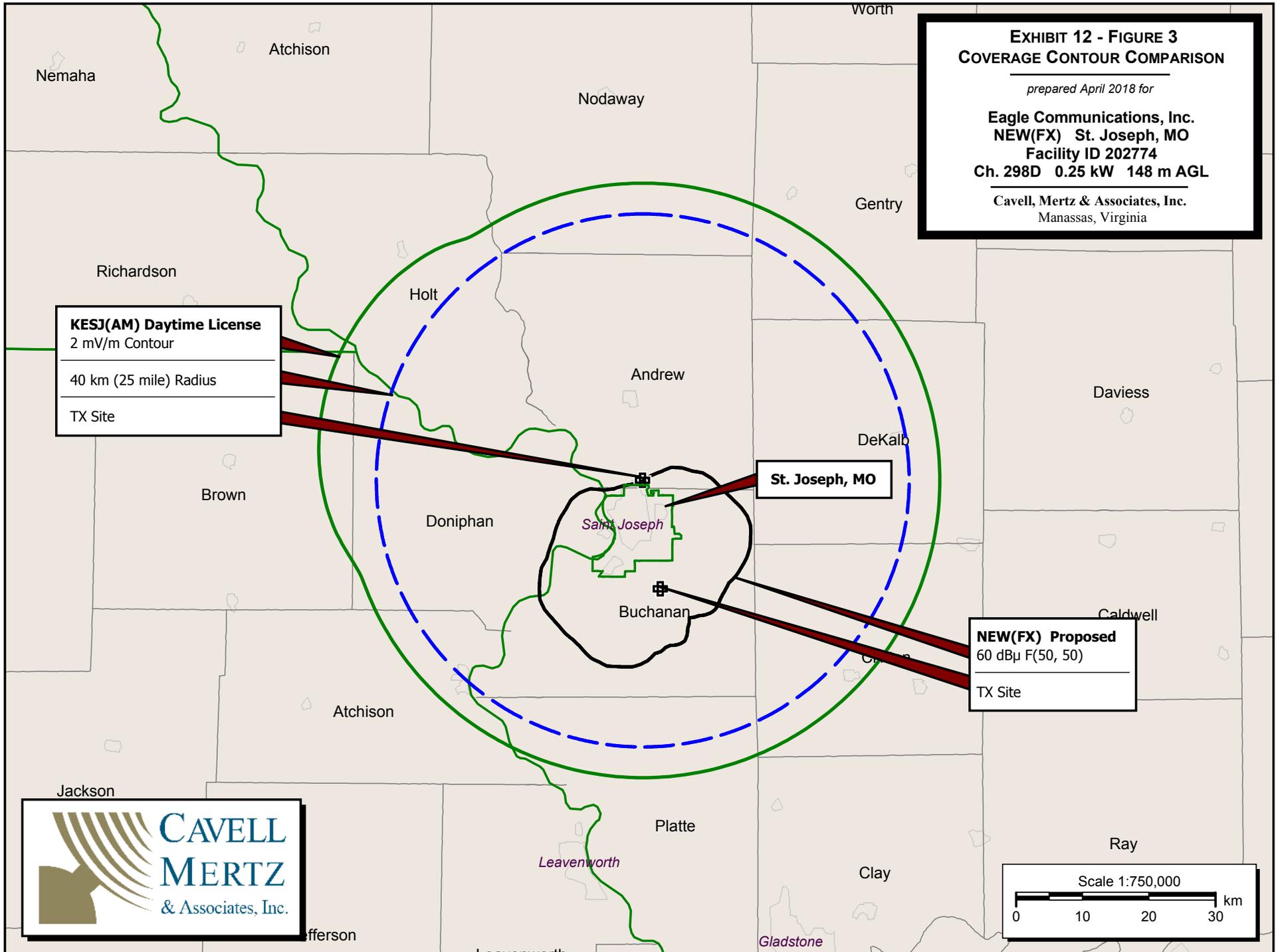
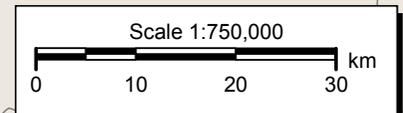
TX Site

**St. Joseph, MO**

**NEW(FX) Proposed**

60 dBμ F(50, 50)

TX Site



**EXHIBIT 12 - FIGURE 4  
CONTOUR PROTECTION**

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