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COMPREHENSIVE EXHIBIT FOR INTERFERENCE ANALYSIS

May 11, 2018

This exhibit supports an application for a new fill-in FM translator to serve AM station WHB with proposed location in Kansas City, KS. This proposal complies fully with the requirements of C.F.R. §74.1204(a) with the exception of facilities protected under 47 C.F.R. §74.1204(d) (KZPT, KQRC) which are addressed by the Undesired to Desired (U/D) Living Way methodology described below. KZPT & KQRF are co-located so one analysis will apply to both KZPT & KQRC. The proposed facility creates no mutual exclusivities with any licensed facilities, or construction permits.

This exhibit contains the Fill-in Service exhibit, Contour Overlap Analysis according to C.F.R. §74.1204, the Living Way methodology with analysis to comply with §74.1204(d), and RF exposure assessment for the proposed facility.

Proposed Facility

The proposed facility is comprised of an approved FM transmitter, flexible coax, and a Scala directional antenna array. The antenna radiation center is located at 984 feet above ground. The proposed ERP for the facility is 65 watts. The ERP exceeds the normal translator HAAT limited ERP because this is a fill-in translator. The proposed translator provides fill-in service for WHB as demonstrated in Exhibit #1-A and #1-B. The coordinate system for the attached maps is NAD 83.

Exhibit #1-A WHB 2 mv Contour

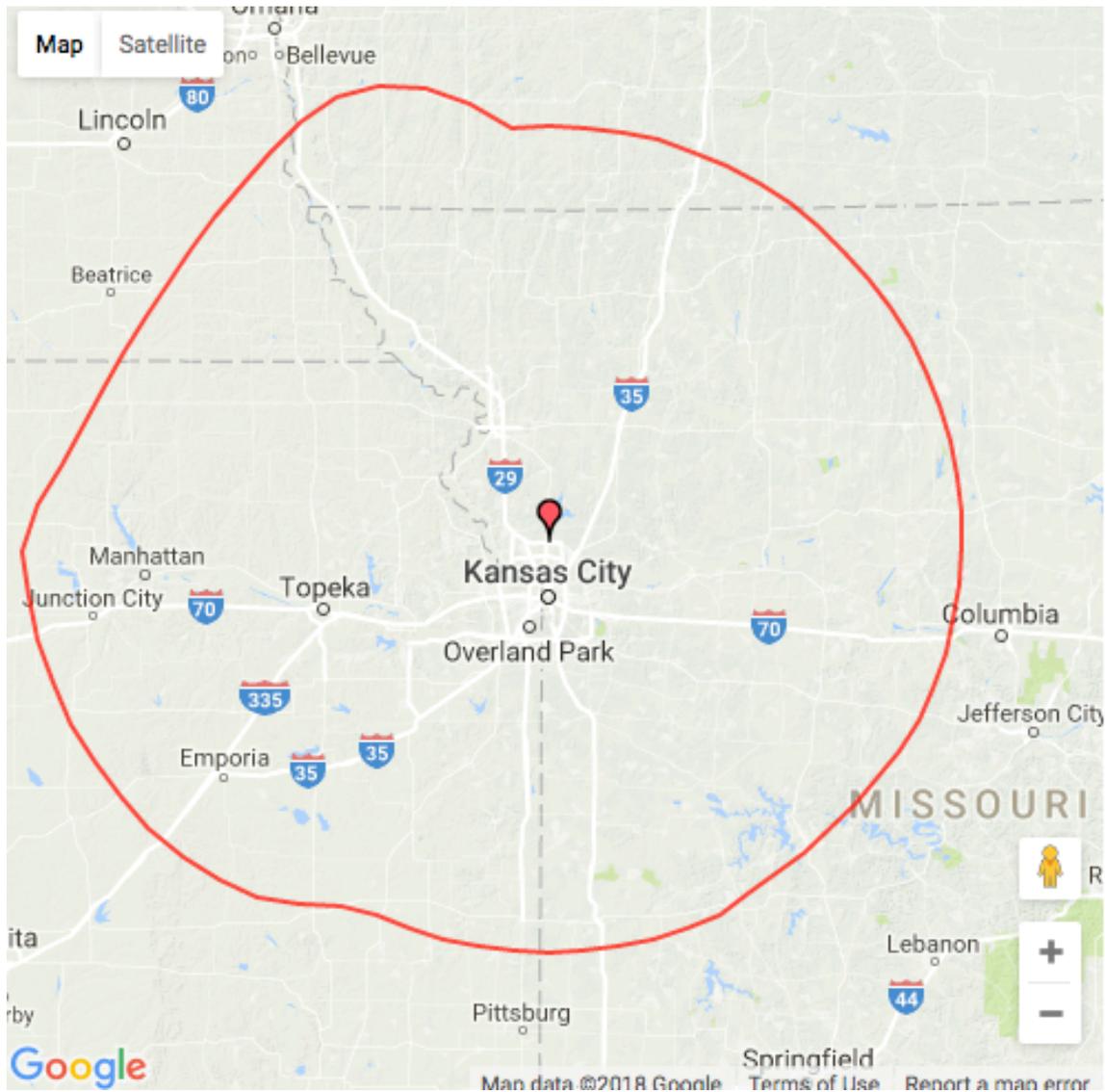
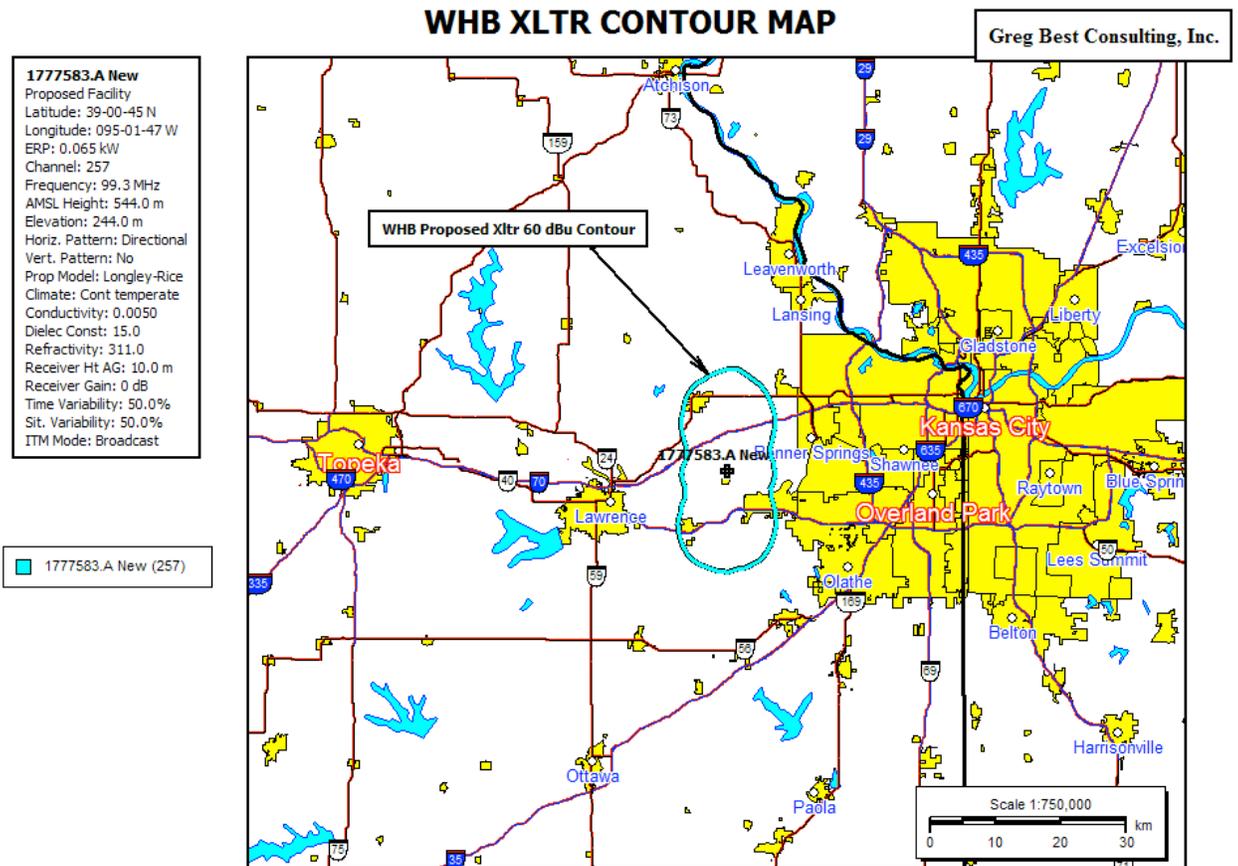


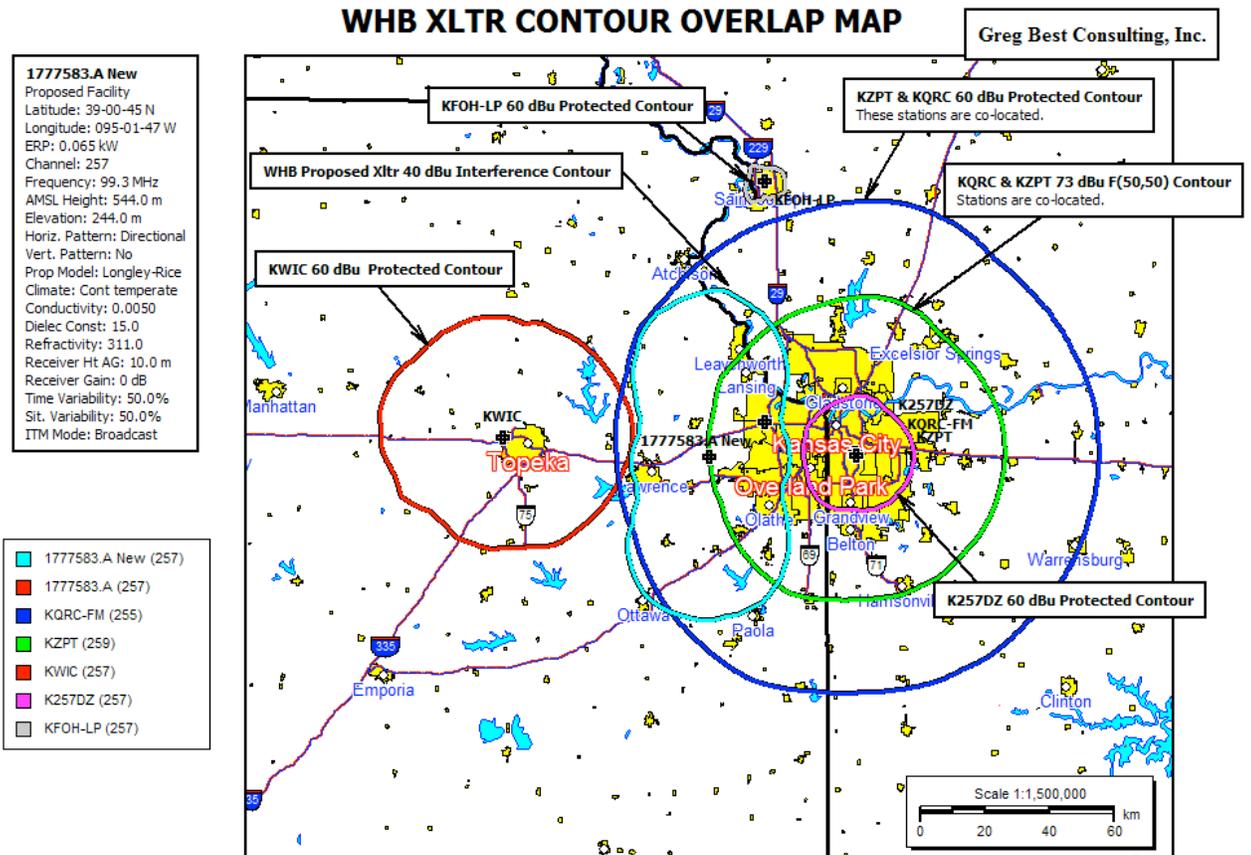
Exhibit #1-B Proposed Fill-in Translator 60 dBu Contour



Interference analysis—Contour Analysis

An interference analysis was conducted using C.F.R. §74.1204. The contour overlap analysis is shown in Exhibit #2 identifying that no prohibited contour overlap exists except with KZPT & KQRC. The contour overlap with these stations is addressed in the next section of this analysis.

Exhibit #2 Contour Overlap Analysis for Proposed Facility



Undesired to Desired Method

Protection to the KQRC & KZPT facilities is provided through the use of Undesired to Desired Signal Strength Ratio (U/D) calculations according to the widely accepted Living Way exhibit.

The proposed antenna is a Scala 2 element CA5-FM/CP YAGI antenna array with radiation center at 300 meters AGL. The elevation pattern and tabulated field values are shown in Exhibit #3-A and #3-B.

The KQRC and KZPT facilities produce a field strength calculated at ground level of the proposed translator location of 73.0 dBu, as shown on the Interference Contour Analysis Map, Exhibit #2. For the translator interference contours, free space calculations are used along with the elevation pattern of the proposed antenna. To assure no interference occurs, a 40 dB stronger signal than the KQRC or KZPT at the proposed translator location must not be received at the ground level. The proposed facility 113 dBu field strength 1x contour was calculated in Exhibit #4-A and plotted in Exhibit #4-B. The proposed antenna location is 300 meters above ground. The height of the proposed interference signal contour above ground is indicated on Exhibit #4-B. As can be seen, the interfering 113 dBu contour (or higher) field strength level does not reach ground level.

The applicant recognizes that the U/D method is only a tool for predicting likely interference. Should any actual interference be experienced, the applicant will cooperate fully in correcting the interference. Corrective steps may require changes in the transmitting antenna or other steps which would require Commission authorization, may require that the translator cease operation except for brief equipment tests, or may require filtering at the receivers which report interference.

Antenna Description

The antenna array is comprised of two Scala CA5-FM/CP antennas with one pointed at 0 degrees with respect to True North and the other antenna pointed at 180 degrees. The azimuth pattern for the antenna is tabulated in the on-line antenna application page in CDBS and the elevation pattern is tabulated on the page following the elevation pattern in this report. The following page describes one of the antennas. The elevation field pattern for the composite antenna is the same as it is for the single element antenna.

Exhibit #3-A—Elevation Pattern of the 2 Element Scala CA5-FM/CP antenna.

A-10
enna
MHz

HDCA-5CP/RM
FM Yagi Antenna
88 to 108 MHz



The Kathrein-Scala HDCA-5CP/RM is a ruggedly built yagi antenna, designed for professional FM transmit and receive applications.

Like all Kathrein-Scala antennas, the HDCA-5CP/RM is made of the finest materials resulting in superior performance and long service life.

The HDCA-5CP/RM may be used stand-alone or in stacked arrays for higher gain, increased side-lobe suppression, or custom azimuth patterns.

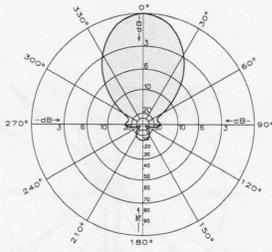
Specifications:

Frequency range	Any specified FM channel 88 to 108 MHz
Gain	4.5 dBd
Power gain	2.82
Impedance	50 or 75 ohms
VSWR	< 1.5:1
Polarization	Circular
Front-to-back ratio	>14 dB
Maximum input power	100 watts (75Ω N) 250 watts (50Ω N)
Azimuth pattern	62 degrees (half-power)
Elevation pattern	62 degrees (half-power)
Connector	50Ω N or 75Ω N
Weight	34.5 lb (15.6 kg)
Dimensions	74.1 x 54 x 51 inches maximum (1882 x 1372 x 1295 mm)
Equivalent flat plate area	2.69 ft ² (0.25 m ²) maximum
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	84 x 13 x 8 inches maximum (2134 x 330 x 203 mm)
Shipping weight	37.5 lb (15.6 kg)
Mounting	For masts of 2.375 inches (60 mm) OD.

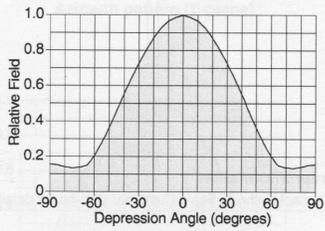
*Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

Order Information:
Contact Kathrein-Scala Customer Service for detailed order information.





Azimuth pattern



Elevation pattern



10768-A



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Exhibit #3-B—Tabulated Elevation Pattern of the Scala 2 element CA5-FM/CP Array

ELEVATION ANGLE (DEG)	ELEVATION FIELD VALUE
0	1.0
5	0.97
10	0.95
15	0.92
20	0.85
30	0.71
40	0.52
50	0.35
60	0.2
70	0.15
80	0.16
90	0.18