

# *APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT*

---

K300DG - LIVE OAK, TEXAS  
BPFT-20170410AGV  
FACILITY ID: 156293  
107.9 MHz / 250 W ERP DA

SAN ANTONIO RADIOWORKS, LLC

DECEMBER, 2017

## **APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT**

The following engineering statement and attached exhibits have been prepared for **San Antonio Radioworks, LLC** ("Radioworks"), licensee of FM translator station K264CJ at Live Oak, Texas, and are in support of their application for modification of construction permit.<sup>1</sup> This application proposes a modification to the existing construction permit by relocating the facility. The current construction permit is under FCC File No. BPFT-20170410AGV.

The translator is licensed to operate on FM channel 264 with a maximum effective radiated power of 250 Watts utilizing a composite directional antenna at 349 meters above mean sea level. The translator is authorized to operate on channel 300 with a maximum effective radiated power of 250 Watts at a center of radiation also at 349 meters with a composite directional antenna. Under this application, it is proposed that the translator operate with a maximum effective radiated power of 250 Watts at a center of radiation of 428.1 meters above mean sea level, 138.5 meters above ground level, also utilizing a composite directional antenna.

The technical parameters in this application specify a different site than that authorized or licensed. The proposed site is located in close proximity to the licensed and authorized site. Exhibit E-1 provides a comparison between the proposed, licensed, and authorized 60 dBu service contours. As this map demonstrates the proposed 60 dBu service contour overlaps both of the other contours. As a result, the proposed modification to the construction permit represents a minor change to the current license.

---

<sup>1</sup> K264BJ is the callsign of the licensed facility, which will change to K300DG once a channel 300 construction permit is implemented. The Facility ID of this translator is 156293.

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

**12.22.2017**

The primary facility for the translator is KAHL at San Antonio, Texas.<sup>2</sup> Exhibit E-2 provides a comparison between the proposed 60 dBu service contour, the KAHL 2.0 mV/m daytime groundwave contour, and a twenty-five mile radius centered on the KAHL transmitter site. This map demonstrates, that at all azimuths, the proposed 60 dBu service contour for the translator would be wholly within the KAHL 25 mile site radius.

The proposed facility complies with the provisions of Section 74.1204 of the Commission's Rules. Due to the channel of operation, Section 74.1205 is not applicable. Exhibit E-3 is a tabular interference study for the proposed facility. This study demonstrates that the contour overlap provisions would be met to all relevant authorizations with the exception of KXTN-FM and KAYZ-LP, both at San Antonio, Texas.<sup>3</sup> The provisions of Section 74.1204(d) will be utilized in regard to KXTN-FM. In the case of KAYZ-LP, that construction permit has been surrendered, and as a result, the contour overlap with that facility is moot.<sup>4</sup> The tabular interference study is graphically depicted in the contour map that is Exhibit E-4.

Although normally prohibited contour overlap would exist between the proposed facility and KXTN-FM, no interference to any populated region is predicted to occur. Exhibit E-5 illustrates the proposed transmitter site along with the KXTN-FM 79.84 dBu service contour. As is depicted, this service contour intersects the proposed translator site. KXTN-FM operates second adjacent to the proposed translator. As a result, interference to that full-power facility is predicted to potentially occur when the field strength of the translator is at least 40 dB above that of KXTN-FM.

---

<sup>2</sup> The Facility ID for KAHL at San Antonio, Texas is 67070.

<sup>3</sup> The Facility ID for KXTN-FM at San Antonio, Texas is 67064. The Facility ID for KAYZ-LP at San Antonio, Texas is 194556. The File No. of the KAYZ-LP construction permit is BNPL-20131112AHO.

<sup>4</sup> Contour overlap with KAYZ-LP is not depicted on related maps.

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

Specifically, interference to KXTN-FM may potentially occur in regions where the translator is at least 119.84 dBu.

The power density for the interfering field strength is given by the following equation:

$$S = \frac{E^2}{Z_0}$$

In this equation, S represents the calculated power density in Watts per square meter, E is the electric field intensity, and  $Z_0$  is the characteristic impedance of free space of 377 ohms.

The power density is also given by:

$$S = \frac{P}{4\pi R^2}$$

Where S is the same units, P is the total power in Watts and R is the distance from the antenna. Rearranging the terms in the equation, it can be solved for the distance to the desired power density as follows:

$$R^2 = \frac{P}{4\pi S}$$

The results of these calculations for depression angles of 0 degrees to 90 degrees are tabulated in Exhibit E-6. The values listed for the relative field at the various depression angles were obtained from published manufacturer data for the proposed antenna. The listed radii values on this tabulation indicate the boundary of the potential interference region. This region of

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

12.22.2017

potential interference is confined to a horizontal radius of 113.75 meters from the antenna.<sup>5</sup> The following satellite image illustrates this radius along with the tower location.



Within this radius, there are several structures. However, as Exhibit E-6 indicates, the closest approach to site elevation of the interference region is 102 meters, and none of the structures in the interference region reach this height. The following street level image is taken from the intersection northwest of the site looking southeast towards the tower. From this image, it can be reasonably inferred that no structures are within the interference region, and by extension zero population is within the interference region.

<sup>5</sup> This analysis assumes that the antenna is non-directional in a horizontal plane, and thus represents a worst-case scenario.

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

12.22.2017



Radioworks is also the licensee of FM translators K279AB at San Antonio, Texas, and K290BO at The Dominion, Texas. Exhibit E-7 illustrates the predicted 60 dBu service contour for all three translators. By inspection it can be seen that the overlap areas are all less than 50 percent of the total area of each contour involved.

The proposed facility would not constitute a significant environmental impact, and is exempt from environmental processing. The translator antenna would utilize an existing tower that is registered with the Commission. The addition of the translator antenna to this structure would not increase the existing environmental impact already present from the tower.

**JEREMY RUCK & ASSOCIATES, INC.**

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

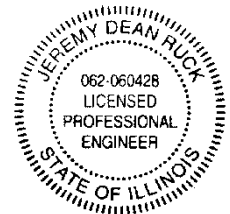
Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

**12.22.2017**

Additionally, the proposed facility would not constitute a radiofrequency radiation hazard to persons at the site. The Commission's online *FM Model* utility returns a calculated maximum power density of  $0.167 \mu\text{W}/\text{cm}^2$  at a distance of 215 meters from the tower. This value complies with the uncontrolled environment of the Commission's safety standard, and is sufficiently low to categorically exclude the facility. The ERI model LPX-2C-HW antenna is considered a "type-3" antenna, and was analyzed as such. The proposed antenna has three-quarter spacing between the elements.

Radioworks certifies that it will coordinate with all other users of the site to ensure that workers and other personnel are not exposed to levels of radiofrequency radiation in excess of the applicable safety standards. Coordination activities will include, but are not necessarily limited to, a reduction in transmitter power or cessation of operation.

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature  
License Expires November 30, 2019

Jeremy D. Ruck, PE  
December 22, 2017

JEREMY RUCK & ASSOCIATES, INC.

P.O. Box 415  
221 S. 1st Avenue  
Canton, IL 61520

Tel: 309.647.1200  
Fax: 855.332.9537  
jeremyruck.com

12.22.2017



**K300DG.X**

PROPOSED

Latitude: 29-36-02.10 N  
Longitude: 098-23-05.60 W  
ERP: 0.25 kW  
Channel: 300  
Frequency: 107.9 MHz  
AMSL Height: 428.1 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**K264CJ.C**

BPFT20170410AGV

Latitude: 29-36-04.80 N  
Longitude: 098-23-00.80 W  
ERP: 0.25 kW  
Channel: 300  
Frequency: 107.9 MHz  
AMSL Height: 349.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**K264CJ**

BLFT20161130ADS

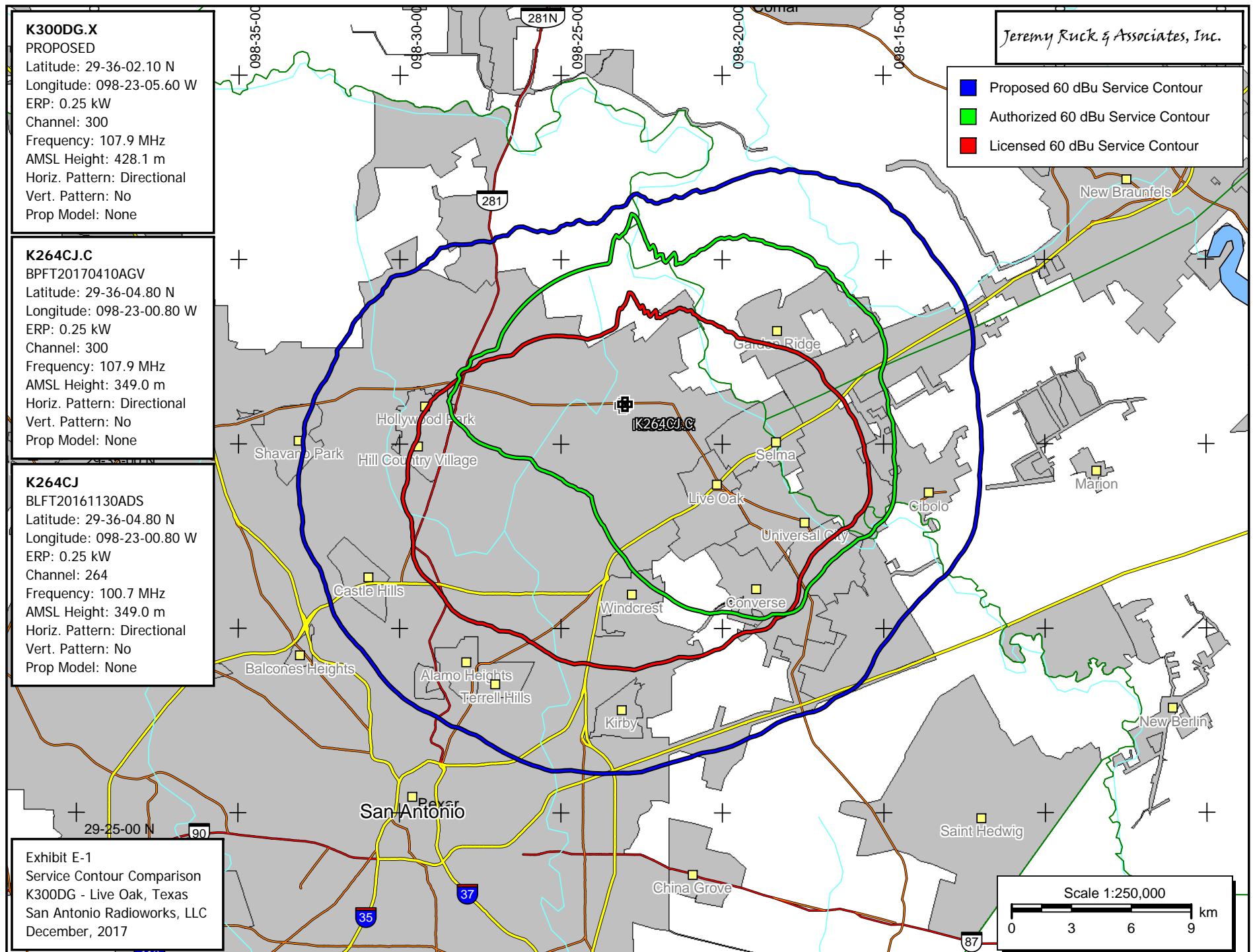
Latitude: 29-36-04.80 N  
Longitude: 098-23-00.80 W  
ERP: 0.25 kW  
Channel: 264  
Frequency: 100.7 MHz  
AMSL Height: 349.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

## Exhibit E-1

Service Contour Comparison  
K300DG - Live Oak, Texas  
San Antonio Radioworks, LLC  
December, 2017

*Jeremy Ruck & Associates, Inc.*

- Proposed 60 dBu Service Contour
- Authorized 60 dBu Service Contour
- Licensed 60 dBu Service Contour





**K300DG.X**

PROPOSED  
Latitude: 29-36-02.10 N  
Longitude: 098-23-05.60 W  
ERP: 0.25 kW  
Channel: 300  
Frequency: 107.9 MHz  
AMSL Height: 428.1 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

Proposed 60 dBu  
Service Contour

KAHL 25 mile  
Site Radius

*Jeremy Ruck & Associates, Inc.*

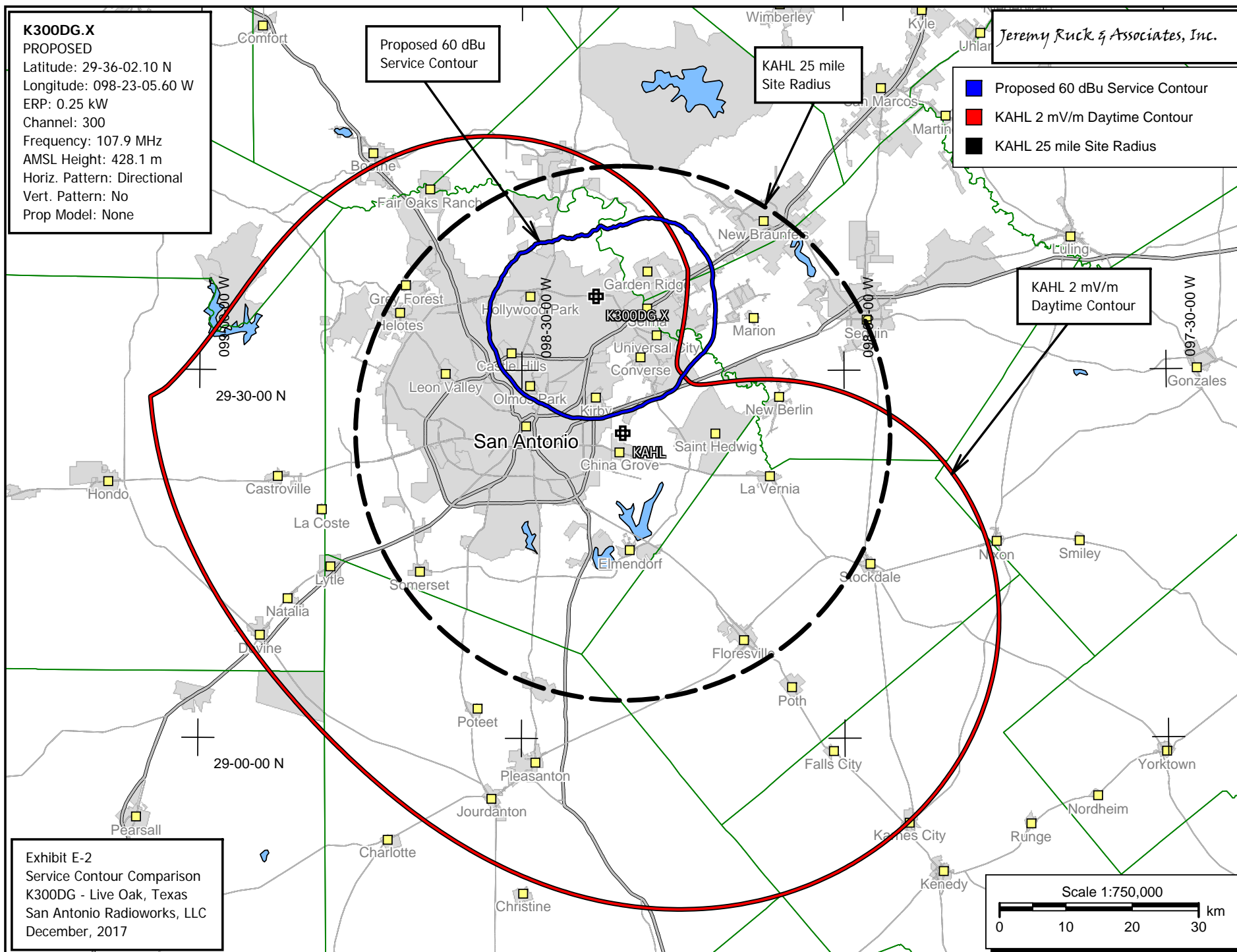
- Proposed 60 dBu Service Contour
- KAHL 2 mV/m Daytime Contour
- KAHL 25 mile Site Radius

KAHL 2 mV/m  
Daytime Contour

Exhibit E-2  
Service Contour Comparison  
K300DG - Live Oak, Texas  
San Antonio Radioworks, LLC  
December, 2017

Scale 1:750,000

0 10 20 30 km



Jeremy Ruck & Associates, Inc.  
Consulting Engineers - Canton, Illinois

Exhibit E-3 - Tabular Interference Study  
K300DB - Live Oak, Texas  
CH# 300D - 107.9 MHz, Pwr= 0.25 kW DA, HAAT= 156.9 M, COR= 428.1 M  
Average Protected F(50-50)= 16.34 km  
Standard Directional

REFERENCE  
29 36 02.1 N.  
98 23 05.6 W.

DISPLAY DATES  
DATA 12-21-17  
SEARCH 12-21-17

CH CITY	CALL	TYPE STATE	ANT TX	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
300D	K264CJ	CP	DC_	57.1	0.15	29 36 04.8	0.250	17.6	5.4	-34.5*	-59.5*
Live Oak		TX		237.1	BPFT20170410AGV	98 23 00.8		349	San Antonio Radioworks, LI		
298CO	KXTN-FM	LIC	_C_	162.1	38.05	29 16 29.0	98.000	12.0	82.8	8.1	-45.8*
San Antonio		TX		342.2	BLH20060612AAY	98 15 52.0	453	611	Tichenor License Corporati		
300L1	KAYZ-LP	CP	___	213.6	21.23	29 26 29.0	0.010			-14.0	-41.3*
San Antonio		TX		33.5	BNPL20131112AHO	98 30 22.0	91	311	North San Antonio Communit		
300C3	KFAN-FM	LIC	_CX	339.8	70.66	30 11 49.0	8.700	99.2	36.2	-37.9*	3.1
Johnson City		TX		159.7	BLH20031104ACG	98 38 19.0	168	664	Hill Country Broadcasting,		
300C1	KIXS	LIC	NCX	123.1	180.34	28 42 24.0	100.000	153.8	57.6	8.7	66.7
Victoria		TX		303.8	BLH20090102ABQ	96 50 06.0	154	166	Townsquare Media Victori a		
247CO	KAJA	LIC	_CY	255.4	33.91	29 31 25.0	100.000	23.5	15.8	24.5R	9.4M
San Antonio		TX		75.3	BMLH20010412AAK	98 43 25.0	300	612	Cc Li censes, LI c		
300D	1564458	APP	_C_	32.0	86.45	30 15 32.0	0.012	10.6	3.3	61.9	36.3
Greenshores		TX		212.3	BNPFT20030317BUV	97 54 26.0	78	339	Juan Alberto Ayala		
300D	1563197	APP	_C_	39.6	96.96	30 16 14.0	0.250	23.8	7.1	58.1	39.9
Austin		TX		220.0	BNPFT20030317GNU	97 44 26.0	12	199	Katherine Pyeatt		

Terrain database is FCC 30 meter , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM  
Contour distances are on direct line to and from reference station. Reference zone= West Zone, Co to 3rd adjacent.  
All separation margins (if shown) include rounding.  
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, \_= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)  
\*\*\*affixed to 'IN' or 'OUT' values = site inside restricted contour.  
Reference station has protected zone issue: Mexico

**K300DG.X**

PROPOSED

Latitude: 29-36-02.10 N

Longitude: 098-23-05.60 W

ERP: 0.25 kW

Channel: 300

Frequency: 107.9 MHz

AMSL Height: 428.1 m

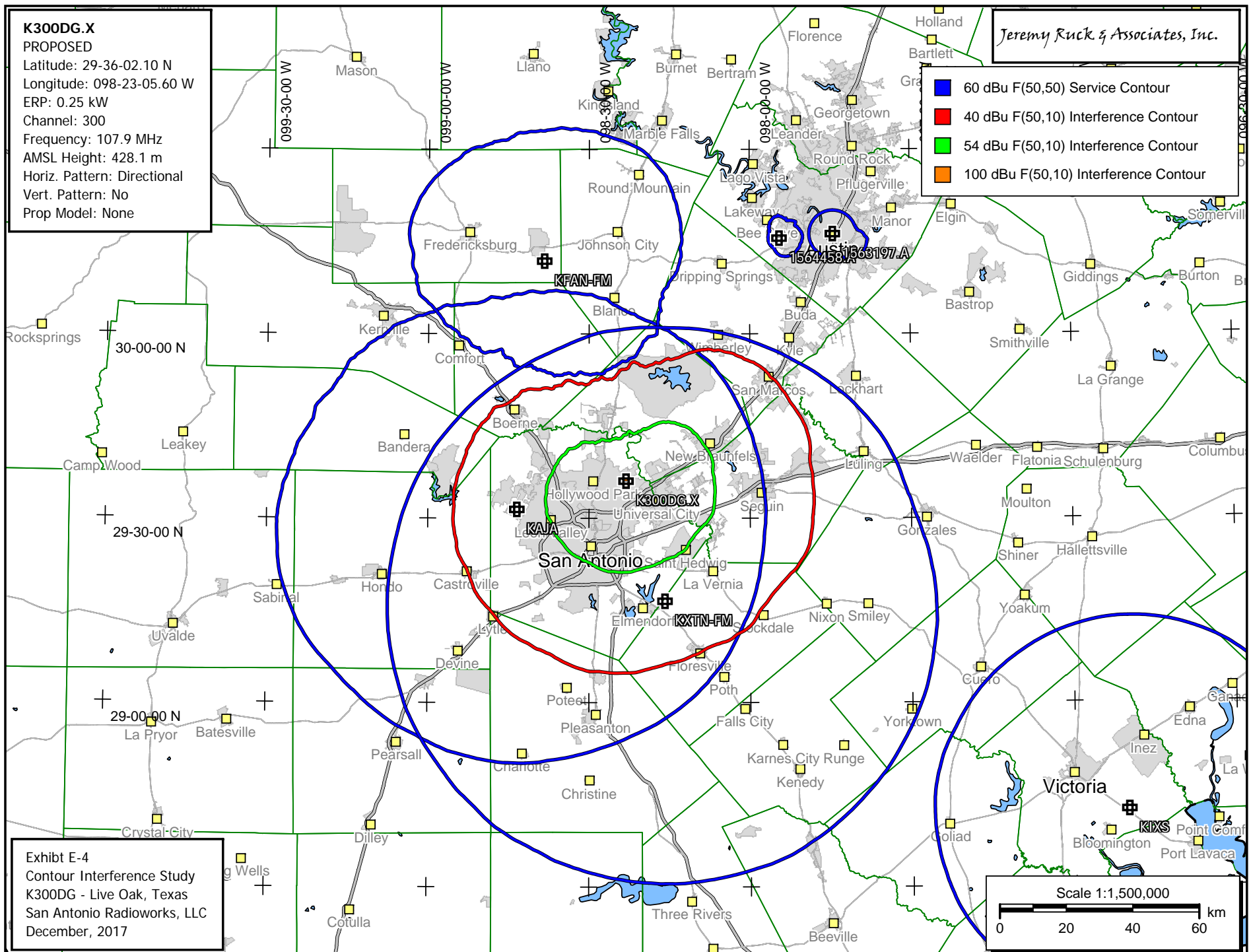
Horiz. Pattern: Directional

Vert. Pattern: No

Prop Model: None

*Jeremy Ruck & Associates, Inc.*

- 60 dBu F(50,50) Service Contour
- 40 dBu F(50,10) Interference Contour
- 54 dBu F(50,10) Interference Contour
- 100 dBu F(50,10) Interference Contour



**K300DG.X**

PROPOSED  
Latitude: 29-36-02.10 N  
Longitude: 098-23-05.60 W  
ERP: 0.25 kW  
Channel: 300  
Frequency: 107.9 MHz  
AMSL Height: 428.1 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**KXTN-FM**

BLH20060612AAY  
Latitude: 29-16-29 N  
Longitude: 098-15-52 W  
ERP: 98.00 kW  
Channel: 298  
Frequency: 107.5 MHz  
AMSL Height: 611.0 m  
Horiz. Pattern: Omni  
Vert. Pattern: No  
Prop Model: None

*Jeremy Ruck & Associates, Inc.*

K300DG Proposed  
Transmitter Site

KXTN-FM 79.84 dBu  
F(50,50) Contour

FCC F(50-50) 79.84 dBu (FCC HAAT)

K300DG.X

098-25-00 W

29-35-00 N

098-20-00 W

Live Oak

Exhibit E-5  
Interference Study  
K300DG - Live Oak, Texas  
San Antonio Radioworks, LLC  
December, 2017

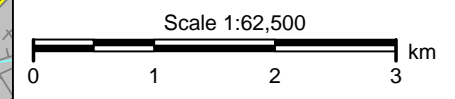


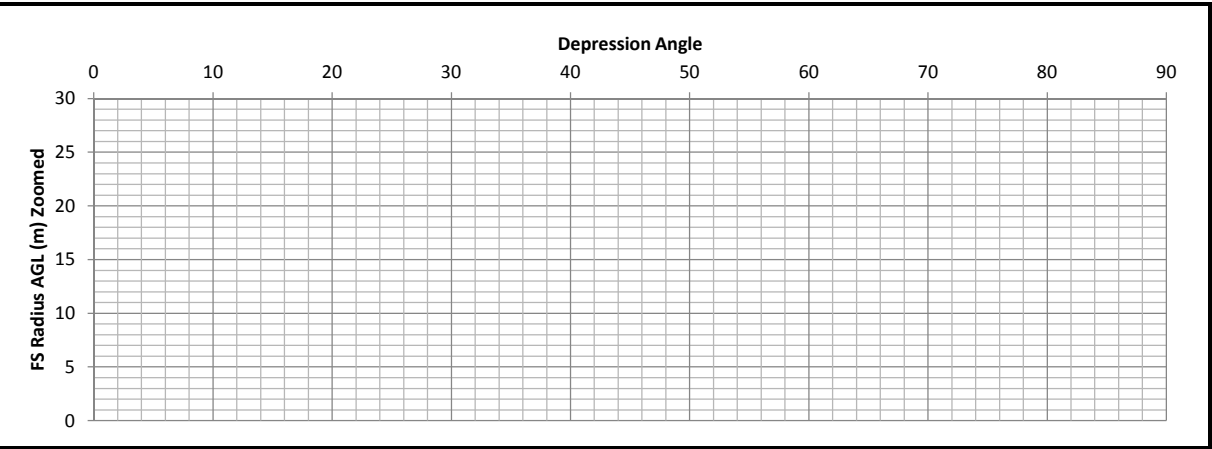
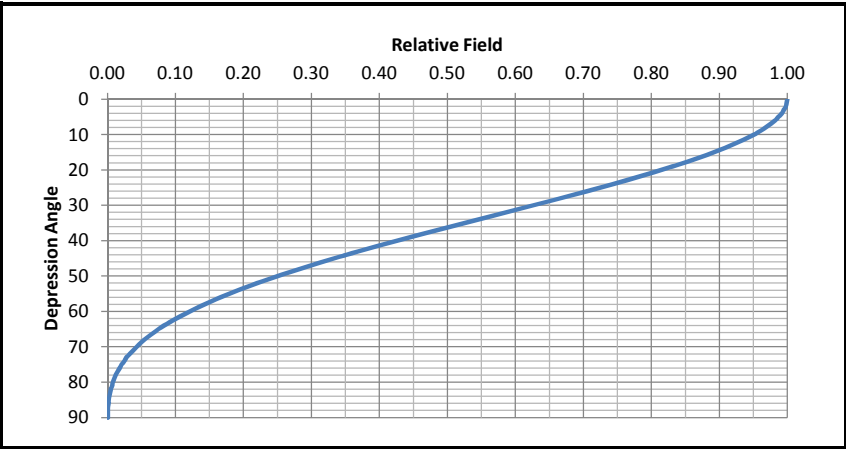


Exhibit E-6

Proximity Interference Analysis

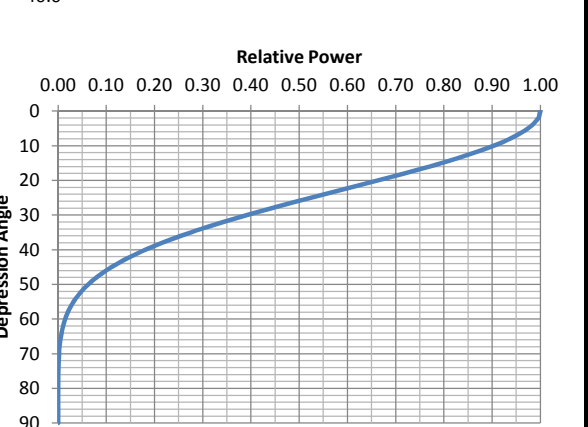
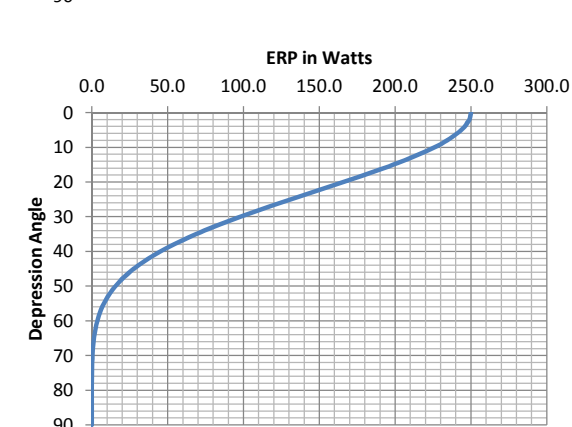
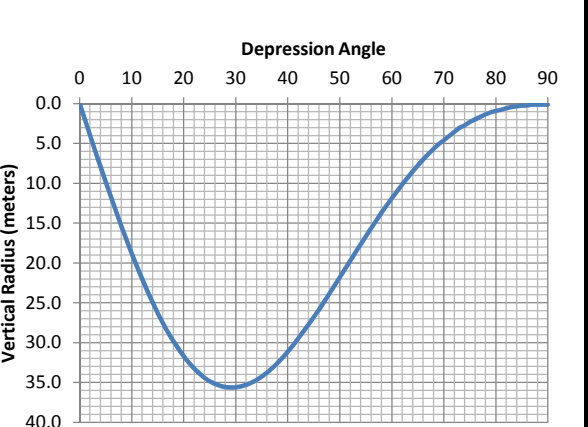
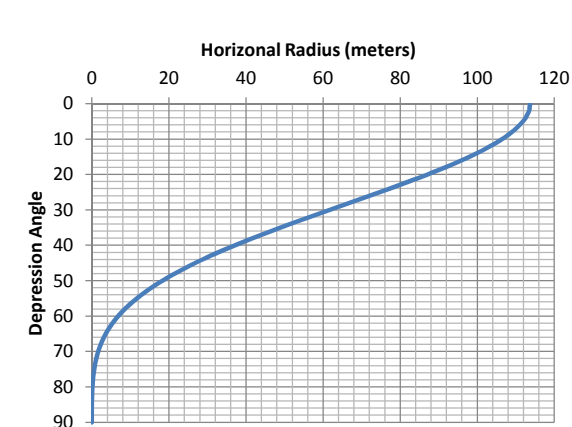
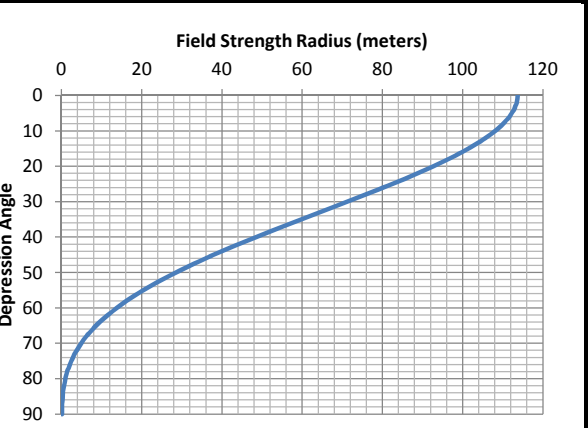
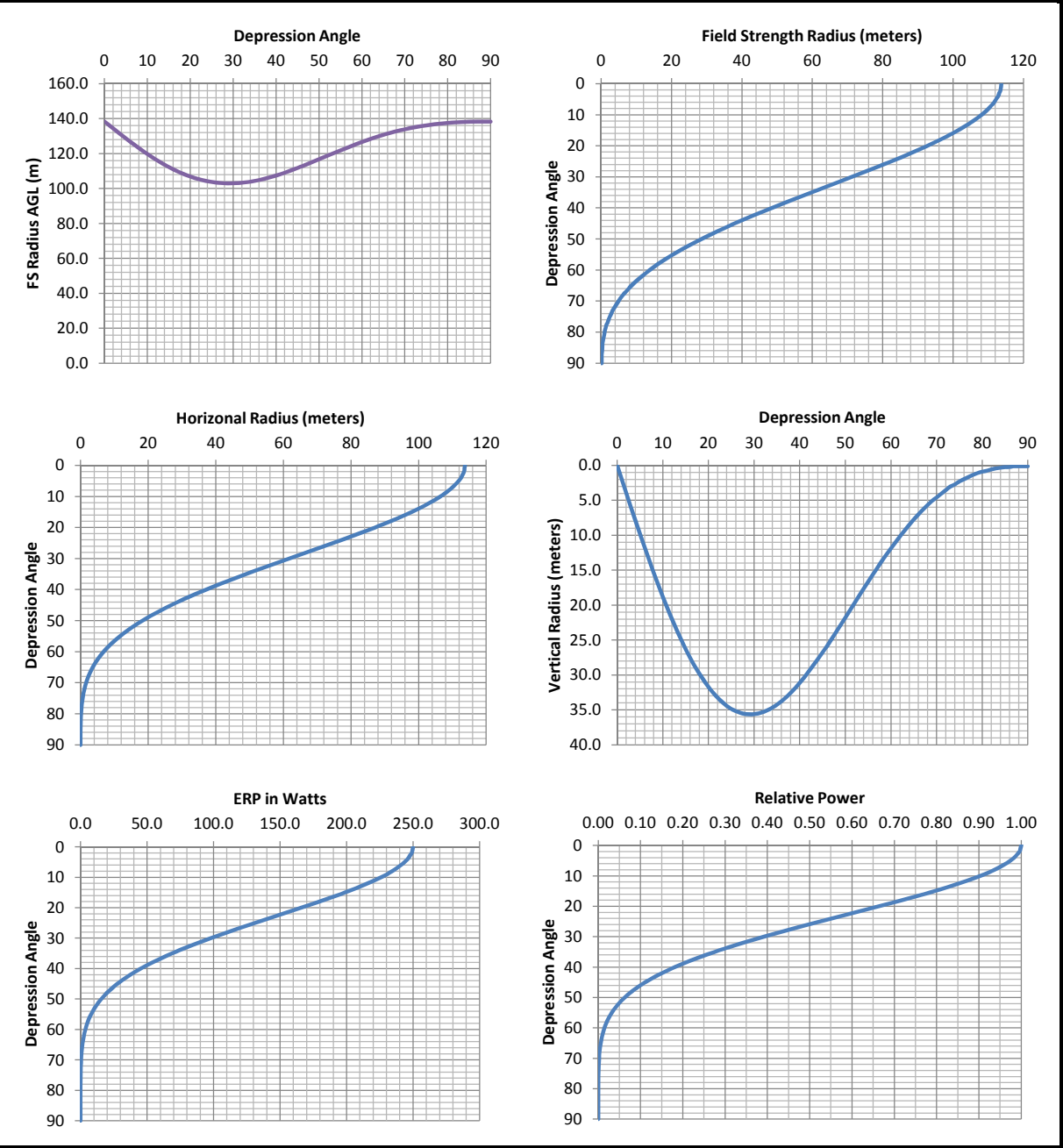
K300DG - Live Oak, Texas

Antenna No:	154	<div><div></div><div></div><div></div></div>	Center of Radiation:	138.5 m AGL
Manufacturer:	ERI	<div><div></div><div></div><div></div></div>	Effective Radiated Power:	250 Watts
Model:	LPX-2C-HW		FS Contour:	119.78 dBu
Number of Bays:	2		E Field Strength:	0.97499 V/m
Bay Spacing:	Half		Z0:	377 Ohms
			Power Density:	0.002521498 W/m^2



Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
0	1.0000	1.0000	250.00	113.75	113.75	0.00	138.50
1	0.9990	0.9980	249.50	113.64	113.62	1.98	136.52
2	0.9980	0.9960	249.00	113.52	113.45	3.96	134.54
3	0.9950	0.9900	247.51	113.18	113.03	5.92	132.58
4	0.9920	0.9841	246.02	112.84	112.57	7.87	130.63
5	0.9870	0.9742	243.54	112.27	111.85	9.79	128.71
6	0.9820	0.9643	241.08	111.70	111.09	11.68	126.82
7	0.9750	0.9506	237.66	110.91	110.08	13.52	124.98
8	0.9680	0.9370	234.26	110.11	109.04	15.32	123.18
9	0.9600	0.9216	230.40	109.20	107.86	17.08	121.42
10	0.9510	0.9044	226.10	108.18	106.53	18.78	119.72
11	0.9400	0.8836	220.90	106.93	104.96	20.40	118.10
12	0.9290	0.8630	215.76	105.68	103.37	21.97	116.53
13	0.9180	0.8427	210.68	104.42	101.75	23.49	115.01
14	0.9050	0.8190	204.76	102.95	99.89	24.90	113.60
15	0.8920	0.7957	198.92	101.47	98.01	26.26	112.24
16	0.8780	0.7709	192.72	99.87	96.00	27.53	110.97
17	0.8630	0.7448	186.19	98.17	93.88	28.70	109.80
18	0.8480	0.7191	179.78	96.46	91.74	29.81	108.69
19	0.8310	0.6906	172.64	94.53	89.38	30.78	107.72
20	0.8150	0.6642	166.06	92.71	87.12	31.71	106.79
21	0.7980	0.6368	159.20	90.77	84.74	32.53	105.97
22	0.7800	0.6084	152.10	88.73	82.27	33.24	105.26
23	0.7620	0.5806	145.16	86.68	79.79	33.87	104.63
24	0.7440	0.5535	138.38	84.63	77.31	34.42	104.08
25	0.7250	0.5256	131.41	82.47	74.74	34.85	103.65
26	0.7050	0.4970	124.26	80.19	72.08	35.16	103.34
27	0.6860	0.4706	117.65	78.03	69.53	35.43	103.07
28	0.6660	0.4436	110.89	75.76	66.89	35.57	102.93
29	0.6460	0.4173	104.33	73.48	64.27	35.63	102.87
30	0.6260	0.3919	97.97	71.21	61.67	35.60	102.90
31	0.6060	0.3672	91.81	68.93	59.09	35.50	103.00
32	0.5860	0.3434	85.85	66.66	56.53	35.32	103.18
33	0.5660	0.3204	80.09	64.38	54.00	35.07	103.43
34	0.5450	0.2970	74.26	61.99	51.40	34.67	103.83
35	0.5250	0.2756	68.91	59.72	48.92	34.25	104.25
36	0.5050	0.2550	63.76	57.44	46.47	33.77	104.73
37	0.4850	0.2352	58.81	55.17	44.06	33.20	105.30
38	0.4650	0.2162	54.06	52.89	41.68	32.57	105.93
39	0.4450	0.1980	49.51	50.62	39.34	31.86	106.64
40	0.4260	0.1815	45.37	48.46	37.12	31.15	107.35
41	0.4070	0.1656	41.41	46.30	34.94	30.37	108.13
42	0.3880	0.1505	37.64	44.14	32.80	29.53	108.97
43	0.3690	0.1362	34.04	41.97	30.70	28.63	109.87
44	0.3510	0.1232	30.80	39.93	28.72	27.74	110.76
45	0.3330	0.1109	27.72	37.88	26.78	26.78	111.72

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.3330	0.1109	27.72	37.88	26.78	26.78	111.72
46	0.3160	0.0999	24.96	35.95	24.97	25.86	112.64
47	0.2990	0.0894	22.35	34.01	23.20	24.87	113.63
48	0.2820	0.0795	19.88	32.08	21.46	23.84	114.66
49	0.2660	0.0708	17.69	30.26	19.85	22.84	115.66
50	0.2500	0.0625	15.63	28.44	18.28	21.78	116.72
51	0.2350	0.0552	13.81	26.73	16.82	20.77	117.73
52	0.2200	0.0484	12.10	25.03	15.41	19.72	118.78
53	0.2060	0.0424	10.61	23.43	14.10	18.71	119.79
54	0.1920	0.0369	9.22	21.84	12.84	17.67	120.83
55	0.1790	0.0320	8.01	20.36	11.68	16.68	121.82
56	0.1660	0.0276	6.89	18.88	10.56	15.65	122.85
57	0.1540	0.0237	5.93	17.52	9.54	14.69	123.81
58	0.1420	0.0202	5.04	16.15	8.56	13.70	124.80
59	0.1310	0.0172	4.29	14.90	7.67	12.77	125.73
60	0.1210	0.0146	3.66	13.76	6.88	11.92	126.58
61	0.1110	0.0123	3.08	12.63	6.12	11.04	127.46
62	0.1010	0.0102	2.55	11.49	5.39	10.14	128.36
63	0.0920	0.0085	2.12	10.47	4.75	9.32	129.18
64	0.0830	0.0069	1.72	9.44	4.14	8.49	130.01
65	0.0750	0.0056	1.41	8.53	3.61	7.73	130.77
66	0.0680	0.0046	1.16	7.74	3.15	7.07	131.43
67	0.0610	0.0037	0.93	6.94	2.71	6.39	132.11
68	0.0540	0.0029	0.73	6.14	2.30	5.70	132.80
69	0.0480	0.0023	0.58	5.46	1.96	5.10	133.40
70	0.0430	0.0018	0.46	4.89	1.67	4.60	133.90
71	0.0380	0.0014	0.36	4.32	1.41	4.09	134.41
72	0.0330	0.0011	0.27	3.75	1.16	3.57	134.93
73	0.0280	0.0008	0.20	3.19	0.93	3.05	135.45
74	0.0250	0.0006	0.16	2.84	0.78	2.73	135.77
75	0.0210	0.0004	0.11	2.39	0.62	2.31	136.19
76	0.0180	0.0003	0.08	2.05	0.50	1.99	136.51
77	0.0150	0.0002	0.06	1.71	0.38	1.66	136.84
78	0.0120	0.0001	0.04	1.37	0.28	1.34	137.16
79	0.0100	0.0001	0.03	1.14	0.22	1.12	137.38
80	0.0080	0.0001	0.02	0.91	0.16	0.90	137.60
81	0.0070	0.0000	0.01	0.80	0.12	0.79	137.71
82	0.0050	0.0000	0.01	0.57	0.08	0.56	137.94
83	0.0040	0.0000	0.00	0.46	0.06	0.45	138.05
84	0.0030	0.0000	0.00	0.34	0.04	0.34	138.16
85	0.0020	0.0000	0.00	0.23	0.02	0.23	138.27
86	0.0020	0.0000	0.00	0.23	0.02	0.23	138.27
87	0.0010	0.0000	0.00	0.11	0.01	0.11	138.39
88	0.0010	0.0000	0.00	0.11	0.00	0.11	138.39
89	0.0010	0.0000	0.00	0.11	0.00	0.11	138.39
90	0.0010	0.0000	0.00	0.11	0.00	0.11	138.39



**K300DG.X**

PROPOSED  
Latitude: 29-36-02.10 N  
Longitude: 098-23-05.60 W  
ERP: 0.25 kW  
Channel: 300  
Frequency: 107.9 MHz  
AMSL Height: 428.1 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**K279AB**

BLFT20160722ABK  
Latitude: 29-25-06 N  
Longitude: 098-29-01 W  
ERP: 0.22 kW  
Channel: 279  
Frequency: 103.7 MHz  
AMSL Height: 384.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

**K290BO**

BLFT20140702ACS  
Latitude: 29-38-01 N  
Longitude: 098-37-54 W  
ERP: 0.074 kW  
Channel: 290  
Frequency: 105.9 MHz  
AMSL Height: 465.0 m  
Horiz. Pattern: Directional  
Vert. Pattern: No  
Prop Model: None

Exhibit E-7  
Service Contour Comparison  
K300DG - Live Oak, Texas  
San Antonio Radioworks, LLC  
December, 2017

*Jeremy Ruck & Associates, Inc.*

- K300DG 60 dBu Service Contour
- K279AB 60 dBu Service Contour
- K290BO 60 dBu Service Contour

