APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT

K253BE - IOWA CITY, IOWA
FACILITY ID: 152186
98.5 MHz / 250 W ERP ND

KZIA, INC.

DECEMBER 2015

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

APPLICATION FOR MODIFICATION OF CONSTRUCTION PERMIT

The following engineering statement and attached exhibits have been prepared for **KZIA, Inc.** ("KZIA"), permittee of FM translator station K253BE at Iowa City, Iowa, and are in support of their application for modification of construction permit for that facility.[1]

K253BE is currently authorized to operate with a maximum effective radiated power of 170 Watts at a center of radiation above mean sea level of 344 meters utilizing a non-directional antenna. This application proposes to relocate the facility. As part of the relocation, the maximum effective radiated power would be increased to 250 Watts, with changes to the elevation values occurring as well. A non-directional antenna is proposed for use.

Additionally, KZIA proposes a change in the primary station for the facility. Under this application, it is proposed that the primary station be changed to KZIA(FM) at Cedar Rapids, Iowa.[2] Specifically, the translator would utilize the HD2 stream currently transmitted by KZIA. The proposed facility would serve as a fill-in translator for KZIA, as the proposed 60 dBu service contour would be wholly contained within the KZIA 60 dBu service contour. Exhibit E-1 illustrates both of these contours.

The proposed facility would comply 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-2 is a tabular interference study for the proposed facility. This study demonstrates that the proposed facility would comply with the contour overlap provisions of Section 74.1204 of the

[1] The Facility ID for K253BE at Iowa City is 152186.
[2] The Facility ID for KZIA at

Commission's Rules to all relevant facilities with the exception of KHAK(FM) at Cedar Rapids, Iowa. The provisions of Section 74.1204(d) will be utilized in regard to this station. The tabular interference study is graphically depicted in the contour map in Exhibit E-3.

Although there would be normally prohibited contour overlap between the proposed facility, and KHAK, no interference is predicted to occur to any populated region. Exhibit E-4 illustrates the proposed K253BE site along with the 76.1 dBu KHAK service contour. As this map demonstrates, this service contour intersects the proposed K253BE transmitter site. KHAK operates on a channel second adjacent to K253BE. Therefore, interference to KHAK would be predicted to occur in regions where the field strength of K253BE is at least 40 dBu above that of KHAK. In the vicinity of the transmitter site, that field strength would be at least 116.1 dBu.

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

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

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:

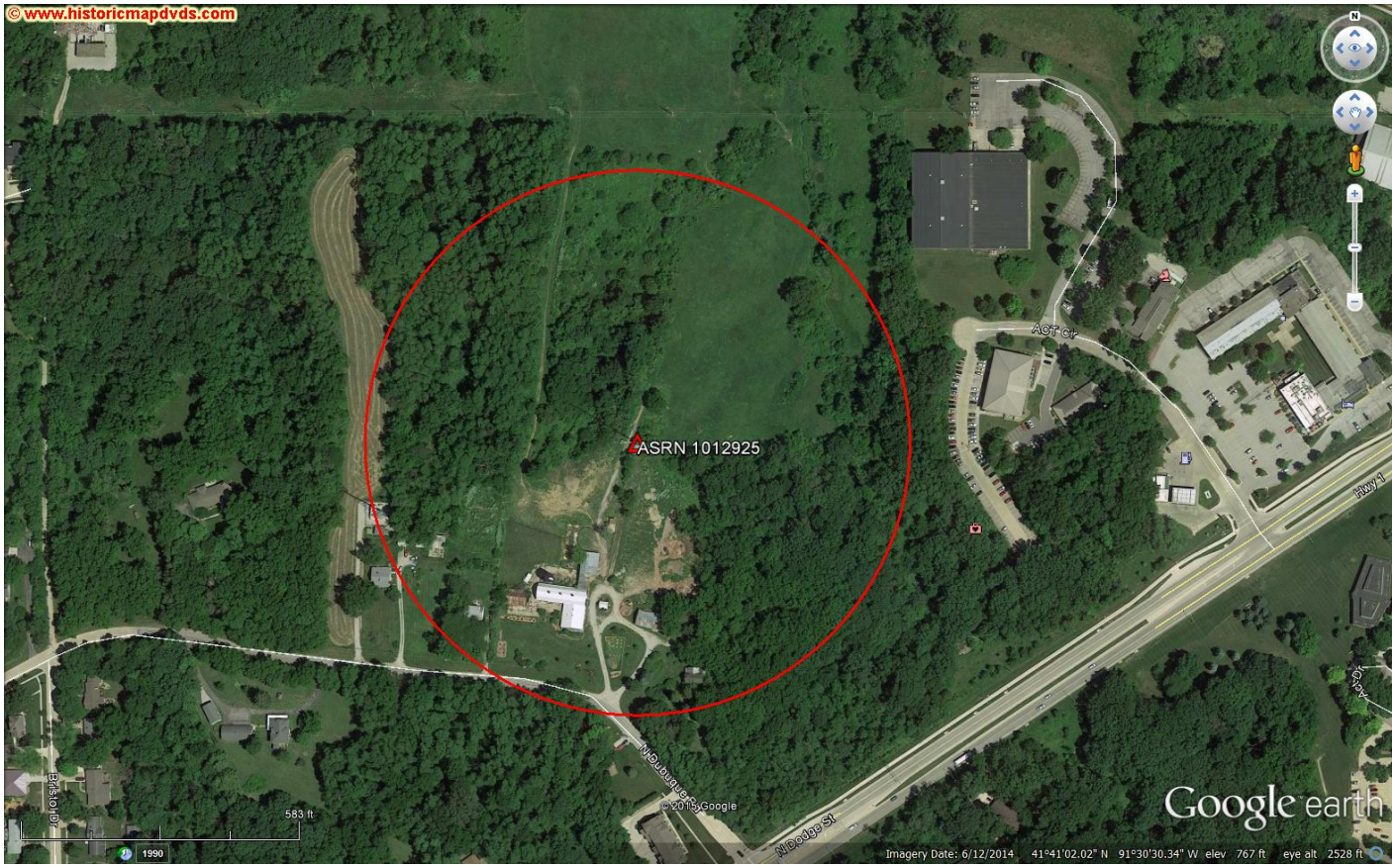
$$\boldsymbol{S = \frac{P}{4\pi R^2}}$$

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-5. The data illustrated in this exhibits assumes a non-directional antenna in the horizontal plane. Values of the relative field at the various depression angles were obtained directly from the manufacturer of the antenna.

As Exhibit E-5 demonstrates, the maximum horizontal distance from the antenna in which interference is predicted to occur is 173.8 meters. The satellite image on the following page illustrates a radius of 173.8 meters.



This photograph illustrates several low-density structures within the maximum horizontal interference radius. Also demonstrated by Exhibit E-5 is the maximum vertical distance from the center of radiation at which interference may potentially occur. The closest approach to ground level of the potential interference region occurs at a depression angle of 9.10 meters above ground level. The following two images are at street level looking at the structures within the maximum radius.

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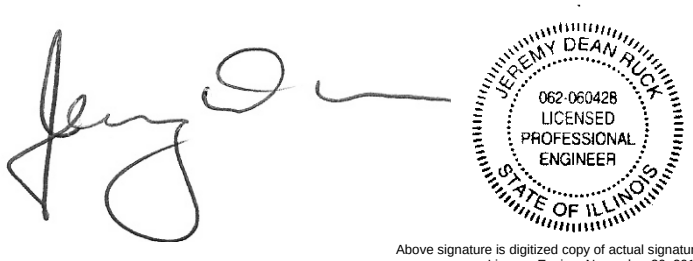
These images that there are no structures of a height of at least 9.10 meters (30 feet) with inhabited areas that would be potentially impacted by the potential interference region. The tallest structure within the horizontal radius is the barn depicted in the first of the street level images. The barn is located at a horizontal distance between 74 and 127 meters from the antenna. Referring to the tables in Exhibit E-5, within this region the potential interference region exists at an elevation of between 55 and 60 meters above ground level. It is respectfully submitted that this elevation is well outside of the range occupied by the barn. As a result of these factors, it is further respectfully submitted that the proposed facility is not predicted to cause interference to any inhabited area.

The proposed facility would not constitute a significant environmental impact, and is exempt from environmental processing. The translator would utilize an existing antenna structure that is

registered with the Commission. The addition of the translator antenna to this tower would not increase the existing environmental impact already present from the facility.

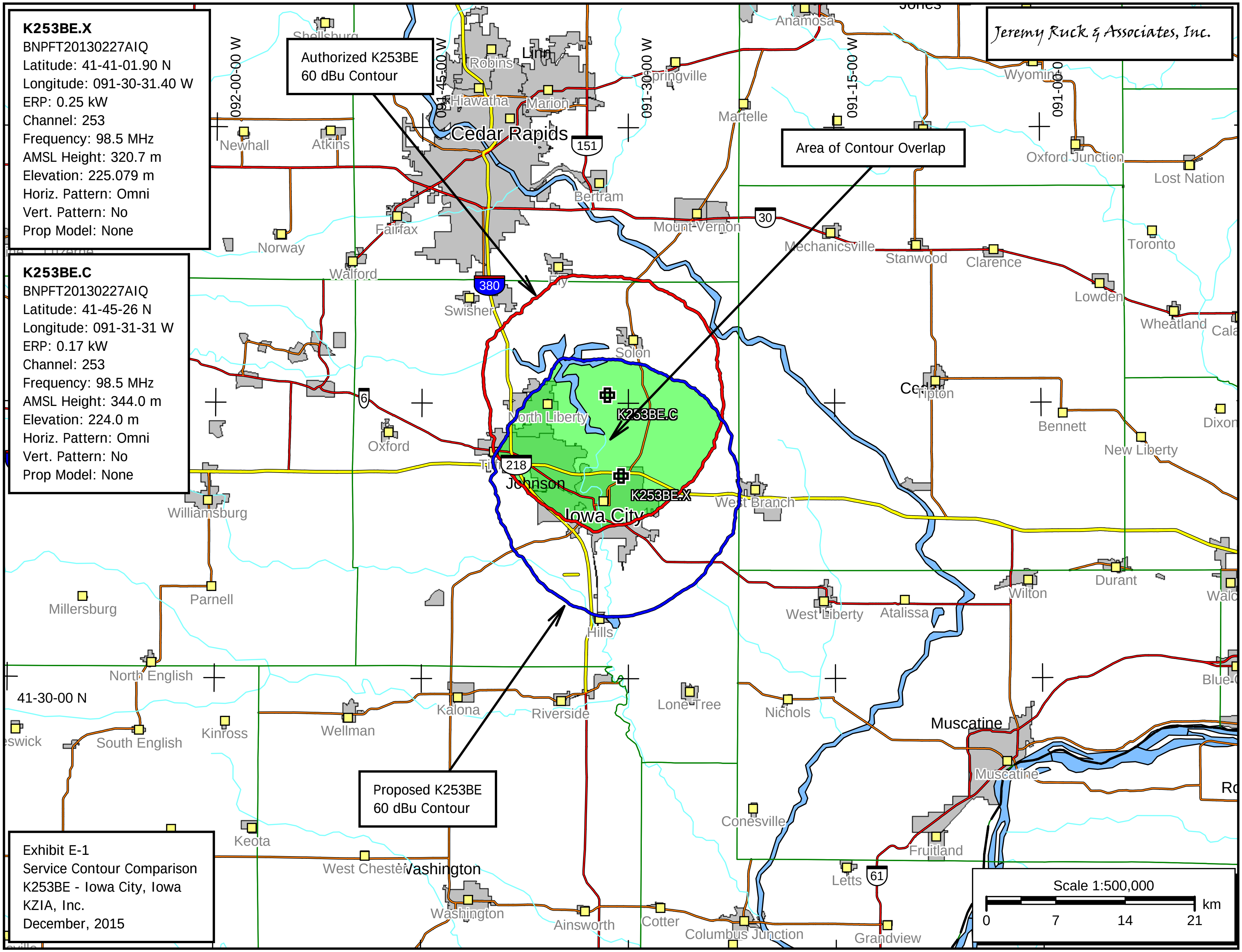
In addition, the proposed facility would not constitute a radiofrequency radiation hazard to persons at the site. Utilizing the equations in Appendix A of *OET Bulletin 65*, under a worst-case scenario, the predicted power density at two meters above ground for the proposed facility is 2.37 $\mu W/cm^2$. This value is considerably less than the upper limit permissible under the general population exposure condition. KZIA 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. Such coordination will include, but is 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, 2017

Jeremy D. Ruck, PE
December 22, 2015


K253BE.X
BNPFT20130227AIQ
Latitude: 41-41-01.90 N
Longitude: 091-30-31.40 W
ERP: 0.25 kW
Channel: 253
Frequency: 98.5 MHz
AMSL Height: 320.7 m
Elevation: 225.079 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None
K253BE.C
BNPFT20130227AIQ
Latitude: 41-45-26 N
Longitude: 091-31-31 W
ERP: 0.17 kW
Channel: 253
Frequency: 98.5 MHz
AMSL Height: 344.0 m
Elevation: 224.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None
Authorized K253BE
60 dBu Contour
Jeremy Ruck & Associates, Inc.
Area of Contour Overlap
Proposed K253BE
60 dBu Contour
Exhibit E-1
Service Contour Comparison
K253BE - Iowa City, Iowa
KZIA, Inc.
December, 2015
Scale 1:500,000
0
7
14
21
km
092-00-00 W
091-45-00 W
091-30-00 W
091-15-00 W
41-30-00 N
K253BE.C
K253BE.X
Cedar Rapids
Iowa City
Muscatine
Washington
Johnson
Robins
Linn
Hiawatha
Marion
Springville
Anamosa
Martelle
Wyoming
Oxford Junction
Lost Nation
Newhall
Atkins
Fairfax
Norway
Walford
Bertram
Mount Vernon
Mechanicsville
Stanwood
Clarence
Toronto
Lowden
Wheatland
Swisher
Solon
North Liberty
Oxford
Tipton
Bennett
New Liberty
Dixon
Williamsburg
West Branch
Millersburg
Parnell
Hills
Wilton
Durant
West Liberty
Atalissa
North English
Kalona
Riverside
Lone Tree
Nichols
South English
Kinross
Wellman
Keota
West Chester
Conesville
Fruitland
Letts
Washington
Ainsworth
Cotter
Columbus Junction
Grandview
151
30
380
6
218
61

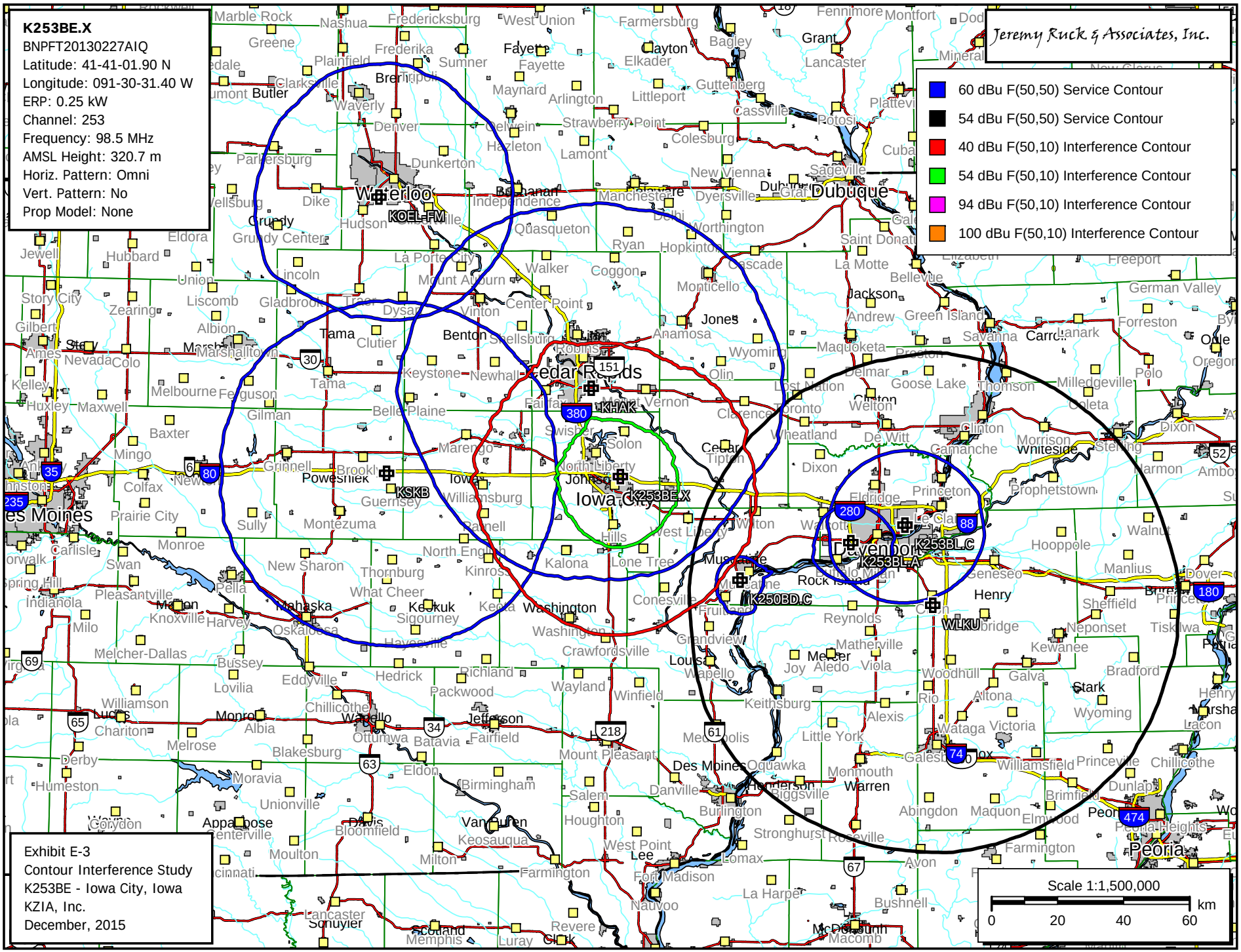
Jeremy Ruck & Associates, Inc.
Consulting Engineers - Canton, Illinois

Exhibit E-2 - Tabular Interference Study
K253BE - Iowa City, Iowa

REFERENCE CH# 253D - 98.5 MHz, Pwr= 0.25 kW, HAAT= 95.3 M, COR= 320.7 M DISPLAY DATES
41 41 01.9 N. Average Protected F(50-50)= 12.57 km DATA 12-22-15
91 30 31.4 W. Omni-directional SEARCH 12-22-15

CH CITY	CALL STATE	TYPE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
253D Iowa City	~~K253BE~~ IA	CP	_C_	350.4 170.4	8.27 BNPFT20130227AIQ	41 45 26.0 91 31 31.0	0.170 110	44.4 344	13.1 Kzia, Inc.	-48.1*	-45.9*
251C1 Cedar Rapids	KHAK IA	LIC	_CN	341.8 161.7	28.16 BLH19790823AG	41 55 28.0 91 36 55.0	100.000 140	7.2 382	59.2 Townsquare Media Cedar Rap	8.0	-32.1*
253C3 Cedar Falls	KOEL-FM IA	LIC	_CX	319.3 138.7	111.72 BMLH20131205ACO	42 26 31.0 92 23 50.0	15.000 129	107.9 407	39.6 The Cedar Rapids Divestitu	-9.1	29.7
253D Bluegrass	K253BL IA	CP	_C_	99.7 280.4	87.14 BMPFT20131126AKN	41 32 49.0 90 28 35.0	0.250	69.9 525	23.1 Educational Media Foundati	5.2	21.9
256C2 Brooklyn	KSKB IA	LIC	_C_	270.8 90.2	70.56 BLED20070328AAA	41 41 23.0 92 21 31.0	44.000 160	5.9 427	51.9 Florida Public Radio, Inc.	51.5	17.6
253D Bluegrass	K253BL IA	APP	_C_	106.1 286.6	72.38 BMPFT20151207AKF	41 30 03.0 90 40 24.0	0.075	36.2 365	10.7 Educational Media Foundati	23.8	19.6
255B Rock Island	WLKU IL	LIC	_CX	112.5 293.2	102.03 BMLED20110329ADS	41 19 39.0 90 22 46.0	39.000 281	7.4 501	74.7 Educational Media Foundati	82.0	25.8
250D Stocktown	K250BD IA	CP	_C_	131.0 311.3	47.86 BNPFT20130325AJB	41 24 02.0 91 04 32.0	0.250 36	1.1 225	7.1 Citicasters Licenses, Inc.	34.0	39.7

Terrain database is NED 03 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
In & Out distances between contours are shown at closest points. 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: AM tower


K253BE.X
BNPFT20130227AIQ
Latitude: 41-41-01.90 N
Longitude: 091-30-31.40 W
ERP: 0.25 kW
Channel: 253
Frequency: 98.5 MHz
AMSL Height: 320.7 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None
Jeremy Ruck & Associates, Inc.
60 dBu F(50,50) Service Contour
54 dBu F(50,50) Service Contour
40 dBu F(50,10) Interference Contour
54 dBu F(50,10) Interference Contour
94 dBu F(50,10) Interference Contour
100 dBu F(50,10) Interference Contour
Waterloo
KOEL-FM
Dubuque
Cedar Rapids
KHAK
Iowa City
K253BE-X
Davenport
K253BLC
K253BLA
K250BD-C
WLKU
Peoria
KSKB
Scale 1:1,500,000
0 20 40 60 km
Exhibit E-3
Contour Interference Study
K253BE - Iowa City, Iowa
KZIA, Inc.
December, 2015

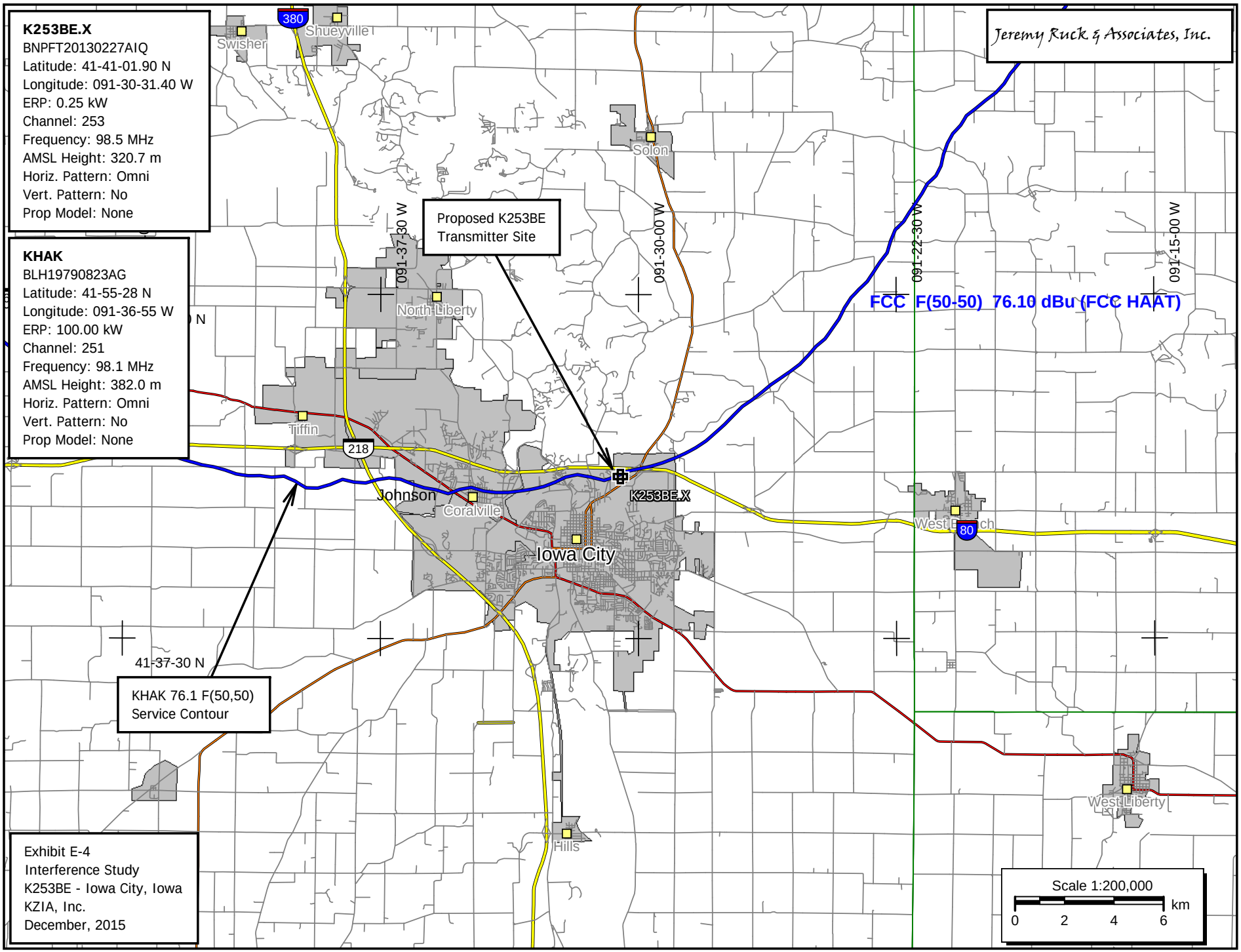
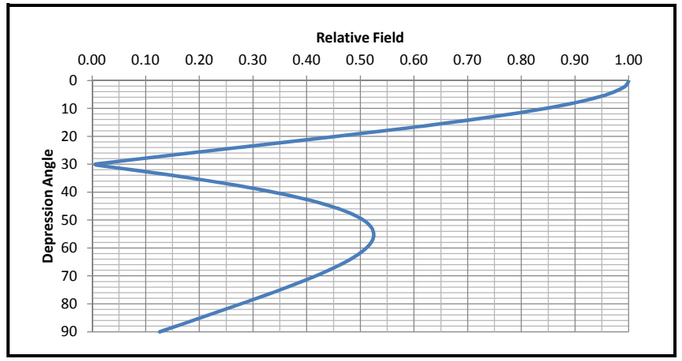
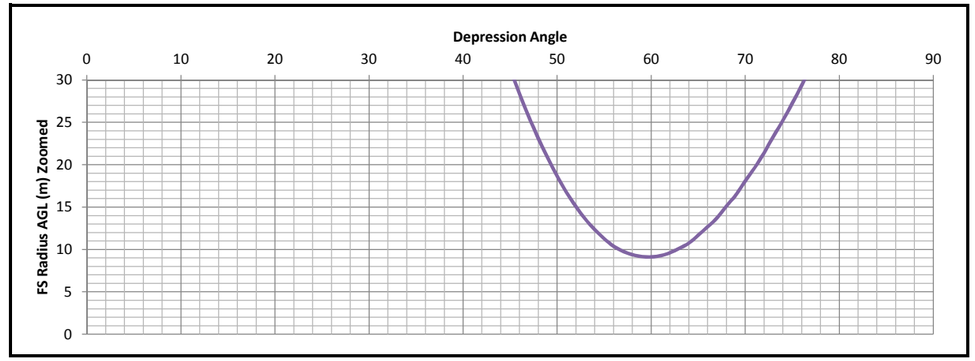

K253BE.X
BNPFT20130227AIQ
Latitude: 41-41-01.90 N
Longitude: 091-30-31.40 W
ERP: 0.25 kW
Channel: 253
Frequency: 98.5 MHz
AMSL Height: 320.7 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None
KHAK
BLH19790823AG
Latitude: 41-55-28 N
Longitude: 091-36-55 W
ERP: 100.00 kW
Channel: 251
Frequency: 98.1 MHz
AMSL Height: 382.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None
Jeremy Ruck & Associates, Inc.
Proposed K253BE
Transmitter Site
FCC F(50-50) 76.10 dBu (FCC HAAT)
091-37-30 W
091-30-00 W
091-22-30 W
091-15-00 W
41-37-30 N
KHAK 76.1 F(50,50)
Service Contour
Swisher
Shueyville
Solon
North Liberty
Tiffin
Johnson
Coralville
Iowa City
K253BE.X
West Branch
West Liberty
Hills
380
218
80
Exhibit E-4
Interference Study
K253BE - Iowa City, Iowa
KZIA, Inc.
December, 2015
Scale 1:200,000
km
0
2
4
6

Exhibit E-5
Proximity Interference Analysis
K253BE - Iowa City, Iowa

Antenna No:	29	Center of Radiation:	86 m AGL
Manufacturer:	ERI	Effective Radiated Power:	250 Watts
Model:	1002F	FS Contour:	116.1 dBu
Number of Bays:	2	E Field Strength:	0.63826 V/m
Bay Spacing:	Lambda	Z0:	377 Ohms
		Power Density:	0.001080584 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	173.76	173.76	0.00	86.00
1	0.9980	0.9960	249.00	173.42	173.39	3.03	82.97
2	0.9940	0.9880	247.01	172.72	172.62	6.03	79.97
3	0.9850	0.9702	242.56	171.16	170.92	8.96	77.04
4	0.9740	0.9487	237.17	169.25	168.83	11.81	74.19
5	0.9600	0.9216	230.40	166.81	166.18	14.54	71.46
6	0.9420	0.8874	221.84	163.68	162.79	17.11	68.89
7	0.9220	0.8501	212.52	160.21	159.02	19.52	66.48
8	0.8990	0.8082	202.05	156.21	154.69	21.74	64.26
9	0.8730	0.7621	190.53	151.70	149.83	23.73	62.27
10	0.8450	0.7140	178.51	146.83	144.60	25.50	60.50
11	0.8140	0.6626	165.65	141.44	138.84	26.99	59.01
12	0.7810	0.6100	152.49	135.71	132.74	28.22	57.78
13	0.7450	0.5550	138.76	129.45	126.14	29.12	56.88
14	0.7080	0.5013	125.32	123.02	119.37	29.76	56.24
15	0.6690	0.4476	111.89	116.25	112.29	30.09	55.91
16	0.6290	0.3956	98.91	109.30	105.06	30.13	55.87
17	0.5870	0.3446	86.14	102.00	97.54	29.82	56.18
18	0.5440	0.2959	73.98	94.53	89.90	29.21	56.79
19	0.4990	0.2490	62.25	86.71	81.98	28.23	57.77
20	0.4550	0.2070	51.76	79.06	74.29	27.04	58.96
21	0.4090	0.1673	41.82	71.07	66.35	25.47	60.53
22	0.3630	0.1318	32.94	63.08	58.48	23.63	62.37
23	0.3170	0.1005	25.12	55.08	50.70	21.52	64.48
24	0.2720	0.0740	18.50	47.26	43.18	19.22	66.78
25	0.2260	0.0511	12.77	39.27	35.59	16.60	69.40
26	0.1800	0.0324	8.10	31.28	28.11	13.71	72.29
27	0.1350	0.0182	4.56	23.46	20.90	10.65	75.35
28	0.0910	0.0083	2.07	15.81	13.96	7.42	78.58
29	0.0480	0.0023	0.58	8.34	7.29	4.04	81.96
30	0.0060	0.0000	0.01	1.04	0.90	0.52	85.48
31	0.0360	0.0013	0.32	6.26	5.36	3.22	82.78
32	0.0760	0.0058	1.44	13.21	11.20	7.00	79.00
33	0.1140	0.0130	3.25	19.81	16.61	10.79	75.21
34	0.1510	0.0228	5.70	26.24	21.75	14.67	71.33
35	0.1870	0.0350	8.74	32.49	26.62	18.64	67.36
36	0.2210	0.0488	12.21	38.40	31.07	22.57	63.43
37	0.2530	0.0640	16.00	43.96	35.11	26.46	59.54
38	0.2840	0.0807	20.16	49.35	38.89	30.38	55.62
39	0.3120	0.0973	24.34	54.21	42.13	34.12	51.88
40	0.3390	0.1149	28.73	58.91	45.12	37.86	48.14
41	0.3640	0.1325	33.12	63.25	47.74	41.50	44.50
42	0.3870	0.1498	37.44	67.25	49.97	45.00	41.00
43	0.4090	0.1673	41.82	71.07	51.98	48.47	37.53
44	0.4280	0.1832	45.80	74.37	53.50	51.66	34.34
45	0.4450	0.1980	49.51	77.32	54.68	54.68	31.32

Depression Angle	Relative Field	Relative Power	ERP Watts	Radii in meters			
				Field Strength	Horizontal	Vertical	AGL
45	0.4450	0.1980	49.51	77.32	54.68	54.68	31.32
46	0.4610	0.2125	53.13	80.10	55.65	57.62	28.38
47	0.4750	0.2256	56.41	82.54	56.29	60.36	25.64
48	0.4870	0.2372	59.29	84.62	56.62	62.89	23.11
49	0.4970	0.2470	61.75	86.36	56.66	65.18	20.82
50	0.5060	0.2560	64.01	87.92	56.52	67.35	18.65
51	0.5130	0.2632	65.79	89.14	56.10	69.28	16.72
52	0.5180	0.2683	67.08	90.01	55.42	70.93	15.07
53	0.5220	0.2725	68.12	90.70	54.59	72.44	13.56
54	0.5240	0.2746	68.64	91.05	53.52	73.66	12.34
55	0.5250	0.2756	68.91	91.23	52.32	74.73	11.27
56	0.5250	0.2756	68.91	91.23	51.01	75.63	10.37
57	0.5230	0.2735	68.38	90.88	49.50	76.22	9.78
58	0.5200	0.2704	67.60	90.36	47.88	76.63	9.37
59	0.5160	0.2663	66.56	89.66	46.18	76.86	9.14
60	0.5110	0.2611	65.28	88.79	44.40	76.90	9.10
61	0.5050	0.2550	63.76	87.75	42.54	76.75	9.25
62	0.4980	0.2480	62.00	86.53	40.63	76.41	9.59
63	0.4900	0.2401	60.03	85.14	38.65	75.86	10.14
64	0.4820	0.2323	58.08	83.75	36.72	75.28	10.72
65	0.4720	0.2228	55.70	82.02	34.66	74.33	11.67
66	0.4620	0.2134	53.36	80.28	32.65	73.34	12.66
67	0.4520	0.2043	51.08	78.54	30.69	72.30	13.70
68	0.4400	0.1936	48.40	76.46	28.64	70.89	15.11
69	0.4290	0.1840	46.01	74.54	26.71	69.59	16.41
70	0.4160	0.1731	43.26	72.29	24.72	67.93	18.07
71	0.4040	0.1632	40.80	70.20	22.85	66.38	19.62
72	0.3910	0.1529	38.22	67.94	21.00	64.62	21.38
73	0.3770	0.1421	35.53	65.51	19.15	62.65	23.35
74	0.3640	0.1325	33.12	63.25	17.43	60.80	25.20
75	0.3500	0.1225	30.63	60.82	15.74	58.74	27.26
76	0.3360	0.1129	28.22	58.38	14.12	56.65	29.35
77	0.3210	0.1030	25.76	55.78	12.55	54.35	31.65
78	0.3070	0.0942	23.56	53.35	11.09	52.18	33.82
79	0.2920	0.0853	21.32	50.74	9.68	49.81	36.19
80	0.2770	0.0767	19.18	48.13	8.36	47.40	38.60
81	0.2620	0.0686	17.16	45.53	7.12	44.97	41.03
82	0.2470	0.0610	15.25	42.92	5.97	42.50	43.50
83	0.2320	0.0538	13.46	40.31	4.91	40.01	45.99
84	0.2170	0.0471	11.77	37.71	3.94	37.50	48.50
85	0.2020	0.0408	10.20	35.10	3.06	34.97	51.03
86	0.1870	0.0350	8.74	32.49	2.27	32.41	53.59
87	0.1720	0.0296	7.40	29.89	1.56	29.85	56.15
88	0.1560	0.0243	6.08	27.11	0.95	27.09	58.91
89	0.1410	0.0199	4.97	24.50	0.43	24.50	61.50
90	0.1260	0.0159	3.97	21.89	0.00	21.89	64.11